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EXPERIENCE WITH THE PFEIFFER CRYSTALLIZATION METHOD FOR THE DIAGNOSIS OF CANCER*

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THE patterns which crystals assume after the addition of blood to a solution of cupric chloride under specified conditions have been shown by E. Pfeiffer[1] to be distinctive between health and disease. His conclusion was based upon many hundred crystallizations. Impurities of all kinds affect the patterns, especially if the substances are in the colloidal state, so that it would be possible to identify their presence not only by chemical means but also by crystallization. Moreover, if the "impurity" is itself impure its own picture would be interfered with and the nature of the second impurity could be detected in its turn. Similarly, in the case of plants the pattern characteristic for the particular species is itself altered when the plant is in a pathological state. Finally, in the case of animals and man the pattern produced by the addition of blood to the cupric chloride is rendered abnormal if the subject is in a pathological state. Hence the diagnosis of disease by a macroscopic test of a minute specimen of the patient's blood became feasible. Pfeiffer's researches gave him the most encouraging results first in regard to the problem of diagnosis of tuberculosis in cattle; he extended them to the subject of cancer in man.

The work has been repeated in this laboratory solely in regard to the latter disease, after having verified the fact of distinctive patterns being produced by various vegetable juices.

The pattern characteristic for cancer has been defined by Pfeiffer as built up on a straight line (short or long) to the centre of which impinge a few lines at angles varying from 5 to 30 degrees. Lines at similar angles may meet at the same point from the opposite side of the base line. The two groups of lines together give an appearance recalling that of tyrosin crystals seen under the microscope. The more numerous the groupings occur in a plate, and the better defined they are, the more advanced is the case considered to be. (Fig. 3 shows the absence of such forms in a normal preparation; Fig. 8 shows the different pattern obtained with a non-cancer case.) The fact that cancerous blood really produces differences which are uniform in kind is readily established even with a few dozen tests.

In Pfeiffer's technique one drop of blood is allowed to fall directly from a finger prick into 1 c.c. of distilled water. Two drops (0.1 c.c.) are introduced after 30 minutes into 10 c.c. of 20 per cent cupric chloride. After one-half minute the mixture is poured out on specially prepared plates resting in a specially constructed chamber, and the readings are made after 18 hours. Apart from some unintentional deviations (chiefly the interval of time elapsing between collection and pouring), and the use of a special chamber (rectified since personal conference with Dr. Pfeiffer) the only innovation which the writer has made has been the use of polarized light for reading the slides. Undertaken originally to ascertain if there were really a distribution of the minimal blood solution over the crystals, it was found that the colour patterns were much more intricate and delicate than those which copper chloride crystals show by themselves. Photographs of plates made with plant juices taken through polarized light show that the patterns came out in strong relief. Oval spaces were then very

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distinct and single or double lines crossing the spaces at certain angles appeared to be characteristic. Similarly, when cancer tissue extracts were used, bundles of crystals came in view which were not evident in the photographs taken with direct light. When reading the plates it is therefore our practice to hold the plate up against the light (day light) and scrutinize the whole crystalline area through polaroid (anti-glare) spectacles, while manipulating a polaroid disc behind the glass. As the disc (or, if preferred the glass plate) is rotated, the sheaves start out into dead-black prominence.

The effect of these sheaves on the texture of the surface of the plates is so decided that it is actually possible to identify at a glance which of a series of crystallizations belong to cancer cases and which not by observing a row of a dozen or more slides lying on the table as one stands at a certain distance from them.

The accompanying table presents the findings to date in a series of crystallizations done with material obtained from the Royal Victoria Hospital, Montreal. In this table all readings are entered, even the early ones which were presumably imperfect owing to inexperience.

TABLE I.

122 PROVED CANCER CASES

Nature of case	*Positive*	*Negative*	*Total*	*Percentage Correct*
Epithelioma	24	1	25	
Gynæcological	4	0	4	
Gastrointestinal	29	4	33	
Mammary	21	2	23	
Lung	2	0	2	
Unclassified	21	3	24	
Sarcoma	9	2	11	
Total	110	12	122	90.1
Benign tumours	1	7	8	87.5

TABLE II.

TREATED CASES

Nature of case	*Positive*	*Negative*	*Total*	*Percentage Correct*
Cancers cured:				
Epitheliomas	0	1	1	
Gynæcological	4	5	9	
Mammary	2	2	2	
Cases under x-ray treatment:				
Epitheliomas	3	0	3	
Gastric	0	1	1	
Mammary	0	1	1	
Total	9	11	20	55

TABLE III.

33 PROVED NON-CANCER CASES

Nature of case	*Positive*	*Negative*	*Total*	*Percentage Correct*
Normal persons	0	2	2	
Acute inflammatory disease	1	5	6	
Calculus	0	2	2	
Chronic diseases	0	12	12	
Tuberculosis	0	2	2	
Various conditions	0	9	9	
Total	1	32	33	96.9

Twenty-four more cases have not been finally diagnosed, and therefore cannot be tabulated.

These results show that a high percentage of cases of active cancer gave the characteristic crystallization pattern, whilst a high percentage of cases in which cancer was not clinically demonstrable failed to give it. The site of the primary growth does not seem to affect the result.

Over one-half of the cases under treatment were clinically free of cancer and yet gave a positive picture.

As regards laboratory animals, those which showed spontaneous tumours or had received grafts showed a positive picture in 79 per cent. Eighteen out of 22 animals in which the graft

TABLE IV.

RESULTS OF PFEIFFER TESTS ON ANIMALS

	Normal			*Unsuccessfully grafted*			*Tumour-bearing*		
		Pfeiffer			*Pfeiffer*			*Pfeiffer*	
	Number	*Positive*	*Negative*	*Number*	*Positive*	*Negative*	*Number*	*Positive*	*Negative*
Monkeys	0	0	0	18	3	15	2	2	0
Fowls	5	0	5	4	1	3	1	1	0
Rats	13	0	13	0	0	0	3	2	1
Hybrid mice	20	2	18	0	0	0	0	0	0
Tumour-susceptible mice	7	6	1	0	0	0	11	8	3
Totals	45	8	37	22	4	18	17	13	4

did not take gave a negative picture. Eight normal animals out of 45 gave a positive picture and these were mice belonging to a cancer-susceptible strain. These results help to confirm Pfeiffer's work on this subject, and also provide additional evidence that these patterns have a definite relation to cancer. They also show that a positive result may be obtained before a tumour has actually appeared.

Positive results were also obtained with the blood extracted from lice and bugs fed on sarcoma-bearing rats.

DISCUSSION

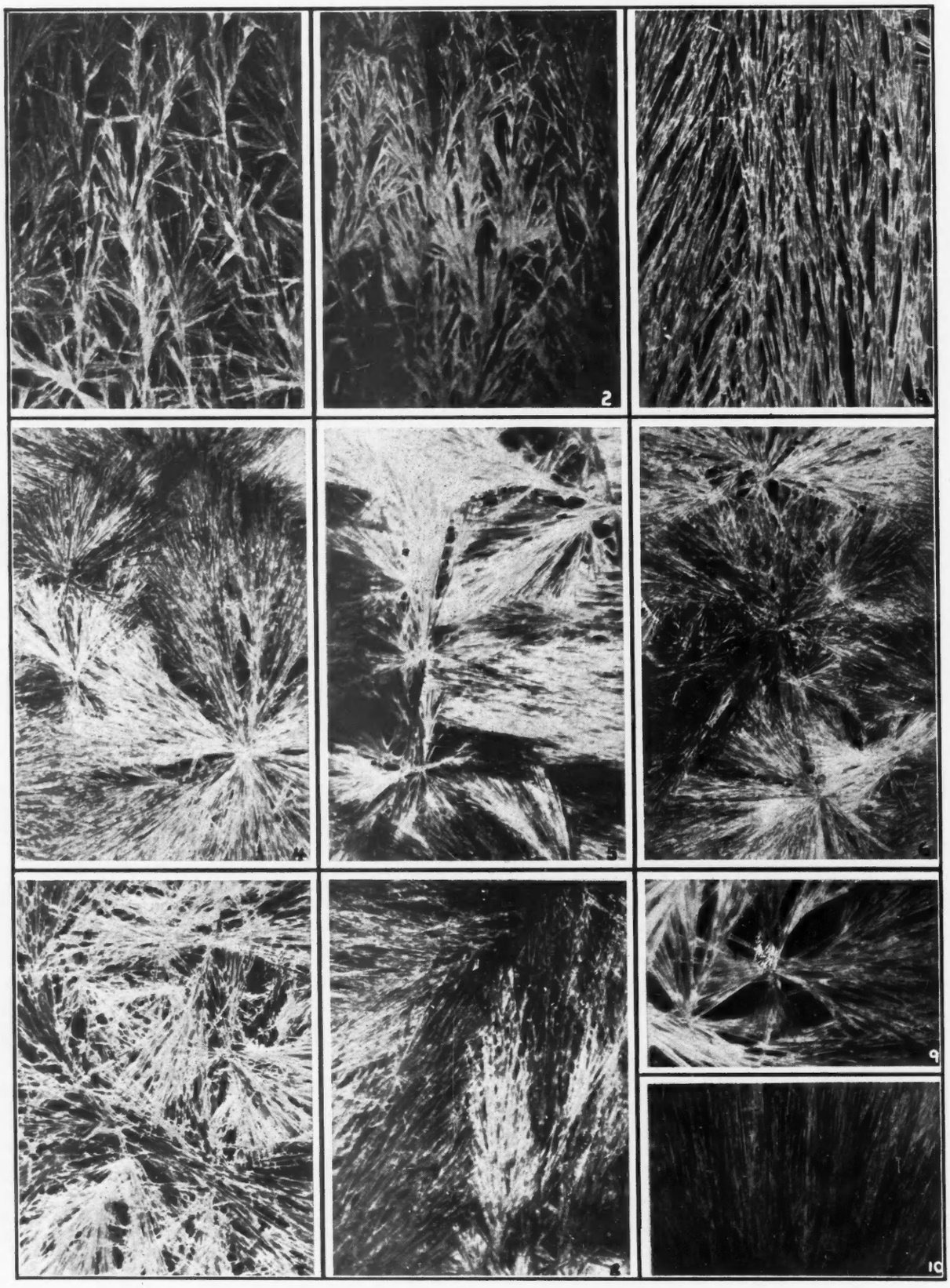
The claim that from crystalline forms one can not only diagnose cancer, but also other diseases is primarily based on the actual empirical experience of obtaining a high percentage of correct readings. In the literature, the chief corroborative evidence is furnished by Bégouin's[2] clinic (1938) in which 31 "blind tests" were read correctly in 96 per cent of specimens submitted to the crystallographer.

1. Consideration of the mechanism of the test makes it less surprising. In the first place, the crystals of the test are not a new chemical substance. The reaction is a physical one. As far back as 1648 Glauber investigated the causes of crystallization, considering them to be of the nature of hitherto unfamiliar or "occult" forces. Kopaczewski,[3] discussing the physical origin of morphogenetic patterns in his treatise on colloid chemistry, gives an account of the history of the subject, quoting the work of Traube, Bütschli, Tomlinson, Ord, Monnier and Vogt, etc., based on the idea that the morphological forms of living organisms might stand for just complicated crystalline systems. Various organic and inorganic substances were added to colloidal solutions, and the resulting patterns were studied. The idea was extended to the question of the cause of the patterns of histological units seen through the microscope, when Leduc[4] (1910-1912) finally was able to mimic mitotic figures.[5] Kopaczewski refers to the appearance of vortices as the result of different rates and different amplitude of molecular movement during the process of evaporation, so that they are evidence of trikinetic forces operating through a variety of materials. Hence, in the writer's view, the forms seen in the Pfeiffer test are really exteriorizations of these forces. It is not that the crystals have a different chemical composition as much as that the normal pattern cannot materialize when the added substance is present. In other words, it is the *act* of crystallization which serves as the *detector* of molecular forces coming into operation only at that time because of the constitution of the added material.

That the process is one of molecular forces and not of the formation of chemical union with blood components is definitely shown by the author's experiment following. Specimens of cancer blood were arranged at measured distances from one another in a quadrate pattern, oriented in the magnetic meridian. Plates were placed at each corner and also near the centre of each square and cupric solution was then poured out. The characteristic pattern appeared in the central plate in those squares at whose corners blood from a cancer patient had been placed, but not in those at whose corners the blood was from other diseases. It will be noted that no blood was added to the copper chloride. The readings were adequately checked by an independent observer. The phenomenon can be accounted for as a resonance occurring between two organic substances occurring at certain points. (Further investigation into this subject has been in progress for many months.)

There is therefore nothing inexplicable about a pathological material producing its own kind of effect, even though the fact is unexpected. If the substances concerned are of protein nature, then the patterns could be regarded as materialized protein patterns in which the existence of the known distinctive spatial grouping of amino- and sulphydryl groups (Jankelevitch[6]) is made objective, as it were, diagrammatically (since the crystalline pattern cannot possibly be a literal picture of such spatial groupings). If the substances are not protein, but of a simpler composite, the principle remains the same. We should thus change our conception of pathological states into terms of changing, deformed, and abnormal patterns of things in virtue of which the physical processes are retarded, suppressed, or otherwise affected in the several diseased states.

2. The use of the crystallizations for diagnosis.—The lowest percentage of correct diagnoses made in specialized laboratories is that given by Pfeiffer, both for himself and for the work done under his guidance at the Hahnemann Hospital, Philadelphia; this is 70 to 83



The accompanying photographs of crystals have been selected out of a considerable number of crystallizations. **Fig. 1.**—Crystals obtained with juice of Calendula officinalis. **Fig. 2.**—Crystals obtained with juice of Chrysanthemum, photographed through polarized light. **Fig. 3.**—Crystals obtained with blood from a normal person. **Figs. 4 and 5.**—Crystals obtained with blood from two cases of advanced cancer. **Fig. 6.**—Crystals obtained with blood from a rat with a malignant hepatoma induced by feeding with butter-yellow. **Fig. 7.**—Crystals obtained with an aqueous extract of carcinoma tissue. **Fig. 8.**—Crystals obtained with blood from a case of cholecystitis. **Fig. 9.**—Crystals obtained with blood from a case of tuberculosis. **Fig. 10.**—Crystals obtained with blood from a case of clinically cured breast cancer.

Fig. 11.—Crystals obtained from a case of squamous carcinoma of cervix, showing the appearance with polarized light. Mag. 50 diam.

per cent. The percentage of correct readings in non-cancer cases approaches 100, which is at least as important to the clinic as the establishment of positive diagnosis in cancer cases. There is however a widespread belief that no cancer test is worth consideration in hospitals unless it is at least 99 per cent correct each way with every blood, although laboratory tests are accepted for other diseases without anything like that degree of conformity. The reason for this attitude, however, is that the cancer is regarded as wholely a concrete entity which can be removed, weighed and mounted, etc. Just as this mass is or is not histologically a neoplasm, so must the test say dogmatically this person has or has not a neoplasm.

This attitude is not considered tenable throughout, as was indicated by the writer in 1919 ("Exact Diagnosis", H. K. Lewis Ltd., London), in basing his interpretations on the principle that cancer is latent for a variable period, not merely because a neoplasm is not detected by physical examination but also because there is a preparatory period which culminates in an actual tumour-formation. Supposing that this preparatory period is associated with the formation of what are now familiar as carcinogenetic substances, and supposing that these account for the Pfeiffer crystallization patterns, then in this test we would be primarily detecting the precursor metabolic changes. A positive result might then be obtained where the clinician fails to find a concrete neoplasm. Similarly, if this metabolic anomaly in inheritable, then the reaction might enable an opinion to be expressed whether a given individual had the "taint" or not.

The fact that an inoperable neoplasm may come to light without having caused any symptoms whatever at least shows that a positive Pfeiffer test need not necessarily be dismissed as wrong because the clinician cannot find the tumour. These considerations must be weighed in analyzing and comparing clinical histories with the Pfeiffer readings.

On the contrary, the test is of considerable value as showing that a given case should be specially watched, when the result is repeatedly positive despite clinical evidence. It would be logical to attempt to advise a regimen which might avert a subsequent tumour-formation.

In support of this conception of cancer we have the evidence that in the declared disease every part of the body will give the Pfeiffer crystals:— tissue extract, saliva, urine, skin secretion, fæces, organisms isolated by blood cultures. Whatever the substances be that account for the pattern they pervade the organism through and through.

Failure to obtain a positive result occurred in 12 cases of undoubted cancer. The possible explanations are: (1) faulty technique; (2) concurrent deep x-ray therapy; (3) organic changes in the blood whereby the substances responsible for the pattern might disappear. As to the first, Pfeiffer himself pours several plates for each case to lessen the risk of faulty readings due to accidental interferences. As to the second, these particular cases were not being treated at the time. As to the third, it is true that in hæmatological experience very advanced cancers sometimes do not give a characteristic picture.

Another aspect of the clinical value of the reaction is provided by the study of treated cases. Negative results may develop in previously positive cases (now considered to be cured by treatment) when tests are repeated after clinical cure. This has proved the best evidence in favour of the ordinary intensive blood-morphological test, where a normal picture may be obtained repeatedly in a person who persistently remains free of disease, and where a "cancer" picture persisting in a person apparently well is upheld by subsequent appearance of recurrence.

3. A third aspect of the crystallization phenomenon concerns its use for the study of the etiology of cancer. As has been indicated in reference to the use of the test for diagnosis, erroneous results may provide a clue to the nature of the process. Similarity of the patterns in some cases to those obtained with diseases other than cancer, for instance, some forms of tuberculosis and some instances of lues would be of importance because suggesting dual factors co-operating in those patients. Those who consider that cancer has a luetic basis would be upheld in those particular instances, and those who consider that cancer may be a late sequel of cured tuberculosis might find confirmation in such cases. In gall-stone cases, where patterns not unlike the "cancer" pattern have been met with, the cholesterolæmia known to exist in both

might be accredited with the similar pictures in both cases. It is clear, then, that by a systematic study of clinical material and of therapeutic and other substances, valuable information could be provided by this test. Its value for diagnosis, however great, would be overshadowed by its use as a tool of investigation. It is significant for instance that the filtered cultures of organisms isolated from the blood and tissues of cancer cases have been found to yield crystalline forms apparently the same as those obtained by the blood (Fig. 7). Here the reaction would then be an addition to the bacteriologist's technique for the identification of microorganisms.

SUMMARY

The technique of the Pfeiffer test is described, and the results of a study of a series of 208 cases are presented. Of these 122 were proved cases of cancer, both treated and untreated; 35 other cases were clinically free of cancer; the remainder are not finally diagnosed.

Taking the cases of the first two groups in which there is no doubt about the nature of the case, the readings were correct in 90.1 per cent of cancer cases, and 91.1 per cent of the non-cancer cases.

The test may provide evidence of a constitutional abnormality in the cancer patient, but if so the change is not fundamentally inherent, because a positive reading may become negative after excision or radium.

Grateful acknowledgment is here made for the facilities granted by the Staff of the Royal Victoria Hospital, Montreal, and to Miss Pauline Jones for assiduous collection both of material and of the necessary case-histories.

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THE TREATMENT OF INFILTRATING TUMOURS OF THE BLADDER*

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Toronto

THE adequate treatment of infiltrating tumours of the bladder is a much more difficult problem than the treatment of malignant papillomata. Many different factors may be present and the individual patient must be considered as well as the disease.

Methods of treatment fall roughly into two groups. The first group, comprising x-ray therapy, radium, and diathermy, aims at the destruction of the tumour *in situ*. The second group, comprising local excision, partial cystectomy and total cystectomy, aims at removal of the diseased area intact. The ideal is attained when one can destroy a tumour without mutilation of the host. This ideal has been reached in the case of benign tumours and small malignant papillomata but not in regard to infiltrating carcinoma.

Cancer of the bladder may be treated by radical or palliative methods just as cancer is treated in other parts of the body. Radical methods with the object of curing the patient should be advised when the disease is limited to the bladder and the patient is otherwise healthy. Palliative treatment has for its purpose the prolongation of life and relief from pain and discomfort. Between these two objectives one is often compelled to make a compromise; one year in comparative comfort and freedom is preferable to two of confinement with pain and dread of repeated treatments. If radical treatment is to be successful it must be adequate and it is in the estimation of the adequate minimum that our difficulty arises.

It is well known that there are cancer cells in apparently healthy tissue adjacent to the tumour. In the bladder it is impossible to determine by inspection or palpation the limit of this "silent" infiltration. An adequate partial cystectomy is too frequently done which leaves

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cancer cells in the tissues at or adjacent to the suture line, with inevitable local recurrence in a few months. Attempts to destroy these cells by the implantation of radon at the time of operation or by post-operative high voltage x-ray therapy are not entirely successful.

In the decade of 1923 to 1933 at the Toronto General Hospital partial resection of the bladder was performed in 26 cases of infiltrating tumour. Two cases were lost sight of in the first twelve months. Of the remaining 24 nine died within two months of operation and 4 more died with local recurrence before the year had elapsed, a mortality of 50 per cent within the first year. Of the remaining 9 patients, 4 died with local recurrence in two to four years. Two are under treatment with recurrent malignant papillomata, and the other three cannot now be traced. In 5 of these 26 cases the area resected necessitated division and re-implantation of one ureter. In one case both ureters were so treated.

From 1934 to 1938 ten patients were subjected to partial cystectomy. The ureter was not interfered with in any of these. Three patients died within two months and one more before twelve months elapsed; 4 more have since died with recurrence, so that at the present time (1939) only 2 patients survive; one operated upon in 1934 is reported to be well, the other had his operation in 1938. The high percentage of local recurrence in these cases is clear proof that the area excised was too small. The difficulty or impossibility of determining by inspection and palpation at the time of operation how large an area should be excised is illustrated by the following case.

CASE 1

A male, aged 60, with gradually increasing frequency for eighteen months, hæmaturia for two months. Cystoscopy showed a small ulcer 1 x 0.5 cm. in area, with heaped-up edges, situated 3 cm. behind the right ureteral orifice. Some bullous œdema was noted surrounding the ulcer. A biopsy was done with the resectoscope and the report read "transitional cell carcinoma". Partial cystectomy was the treatment chosen on account of the small size of the lesion and the wide margin of apparently healthy tissue available for excision. The bladder was mobilized, leaving an excised patch of peritoneum undisturbed on its posterior wall subjacent to the tumour. After closing the peritoneal cavity the bladder was opened 4 cm. from the palpable edge of the tumour and partial cystectomy performed with a wide margin of apparently healthy tissue around the growth, except adjacent to the ureteral opening where only 2 cm. of clearance could be obtained. The pathological report is illuminating.

Fig. 1 shows the ulcer and the area removed drawn to scale. Sections were cut from the ulcer at "A" and from the areas at the edge of the resected bladder wall at "B", "C" and "D". All these sections showed many malignant areas except "B" which showed only a very few tumour cells, although at this point the cut edge is nearest the growth. At a later date blocks were cut and sections prepared from areas "E" to "I". All showed invasion by tumour cells. The malignant process appeared to advance in more or less straight lines in the mucosa, here and there sending roots down into the submucosa in a manner resembling the runners from a strawberry plant.

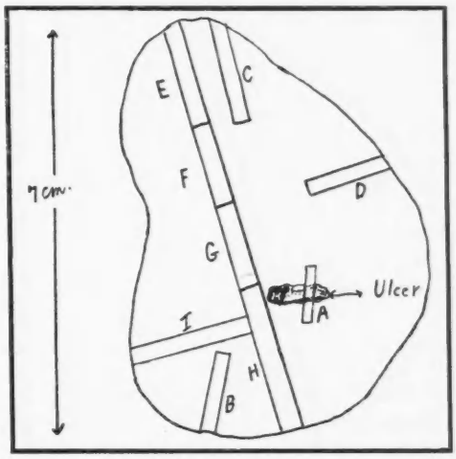

Fig. 1. Case 1.—Diagram of ulcer and excised area of bladder.

In the majority of patients the tumour is so close to the trigone that partial cystectomy is obviously impossible. Suprapubic cystotomy and diathermy, with or without implantation of radon, is the treatment usually employed in these cases.

Between 1923 and 1933 we treated 42 such cases, 29 by diathermy alone and 13 by diathermy and radon. Sixteen patients died during the first year, a certain mortality of 38 per cent. Eight patients were lost sight of in the same period leaving 18 patients to be followed. Five of these eighteen have since died of cancer and 3 of other causes without recurrence. The remaining 10 have been lost sight of and their fate is unknown. From 1934 to 1938 twenty-six cases were treated by diathermy and radon through a suprapubic cystotomy. Twelve patients died in the first year. Two have since died of cancer and 2 have local recurrence. Nine of the 26 are so far free from recurrence, for periods from two to four years.

These statistics do not include malignant papillomata but only sessile infiltrating tumours. It will be observed that the results following diathermy and radon are better than those following partial cystectomy. We think partial cystectomy should be reserved for tumours of the bladder vault and that immediate biopsy of the edge of the area excised should

be done before the operation is completed. In view of the high twelve months' mortality in these patients, and bearing in mind that the patients spent the twelve months or less in anything but comfort, we considered more radical methods in selected cases not only justified but indicated. The following procedures are available:

1. *Iliac ureterostomy.*—For the relief of painful frequency when other means fail, and cystectomy is impossible due to local fixation or is contra-indicated by metastases. This procedure is of course merely palliative, but it is possible that x-ray therapy might be used with benefit on the resting bladder.

2. *Cystectomy with concomitant ureterostomy.*—When pyelonephritis or the general condition of the patient renders uretero-sigmoid anastomosis inadvisable.

3. *Uretero-sigmoid anastomosis* followed in four to eight weeks by cystectomy. This is the procedure which promises the greatest comfort for the patient, but should only be attempted when there are no demonstrable metastases, no pyelonephritis, and the general condition of the patient is good. That dilatation of the ureters in the absence of infection is not a contra-indication is illustrated in the following case.

CASE 2

Mrs. B., aged 56, was admitted in 1934 to the radio-therapeutic department of this hospital suffering from a carcinoma of the urethra extending to the base of the urethra, trigone and the vesico-vaginal septum, resulting in total incontinence. The patient belonged to a nomadic Indian tribe in the north country, and the inconvenience of having to be thawed out of her blanket each morning drove her back to seek relief in 1937.

Fig. 3 shows the upper urinary tract in 1938 one year after operation. The patient stated she voided three times per day and once at night, and was quite comfortable except for a protruding lump; this lump proved to be the bladder which, lacking the last support removed when the ureters were divided, had turned inside out through the fistula and protruded through the vagina. This condition was repaired by a ventral suspension of the bladder to the abdominal wall and the patient is now well eighteen months after the anastomosis.

We have performed uretero-sigmoid anastomosis in 18 cases of cancer of the bladder, with a total mortality of 50.5 per cent. Prior to 1934 four patients were operated upon by the Coffey 2 technique, with three deaths, one due to sloughing of the anastomosis on one side where the ureter had been inserted under tension, and two from pyelonephritis. In the light of the further experience none of these three patients was well chosen; there was evidence that pyelonephritis was present before operation. The survivor is a man (J.S.), 46 years of age at the time of operation. The cystectomy was done one month after anastomosis. Fig. 4 shows his excretory urogram in 1939 seven years after operation. He states he usually sleeps through the night, but occasionally gets up once. He is able to do manual labour and suffers no inconvenience.

From 1934 to May, 1938, 14 more carefully selected cases were operated upon, with 5 deaths from pyelonephritis directly attributable to the operation, one death from pneumonia and one with unsuspected multiple malignancy—a mortality of 50 per cent. There was no mortality in the subsequent cystectomy. Three different techniques were used:

	Cases	*Deaths*
Coffey 2	3	2
Higgins	3	2
Coffey 1	8	3

In our early cases the Coffey 2 technique was used. We developed a great dislike for the catheters. In one case, one of the catheters was inserted too far up the ureter and did not drain until the fifth post-operative day, when, having ulcerated a small pocket for its tip in the upper calyx, it began to drain bloody urine. The patient, however, then developed pyelonephritis and died on the ninth day. It is possible that nephrotomy or nephrectomy might have saved this patient. In all cases the catheters became partially occluded, and patients had a rise of temperature about the fifth or sixth day, which continued until the catheters could be pulled away on the 10th or 12th day.

The last patient on whom the Coffey 2 technique was used recovered. He was a boy (E.W.), 27 years of age, whose bladder was filled with papillary carcinoma. He was quite cachectic. Fig. 5 shows excretory urogram 2 years after anastomosis. He and his father work a small farm alone. The boy states that he can sleep all night and voids three to four times daily, unless he is doing heavy work, such as patching sheaves in harvest, when he has a frequency of every hour and a half, night and day. I cannot explain the difference.

Of the three patients operated upon by the Higgins technique one died on the fifteenth day of pneumonia. The fistula established itself on the twelfth day. One patient died on

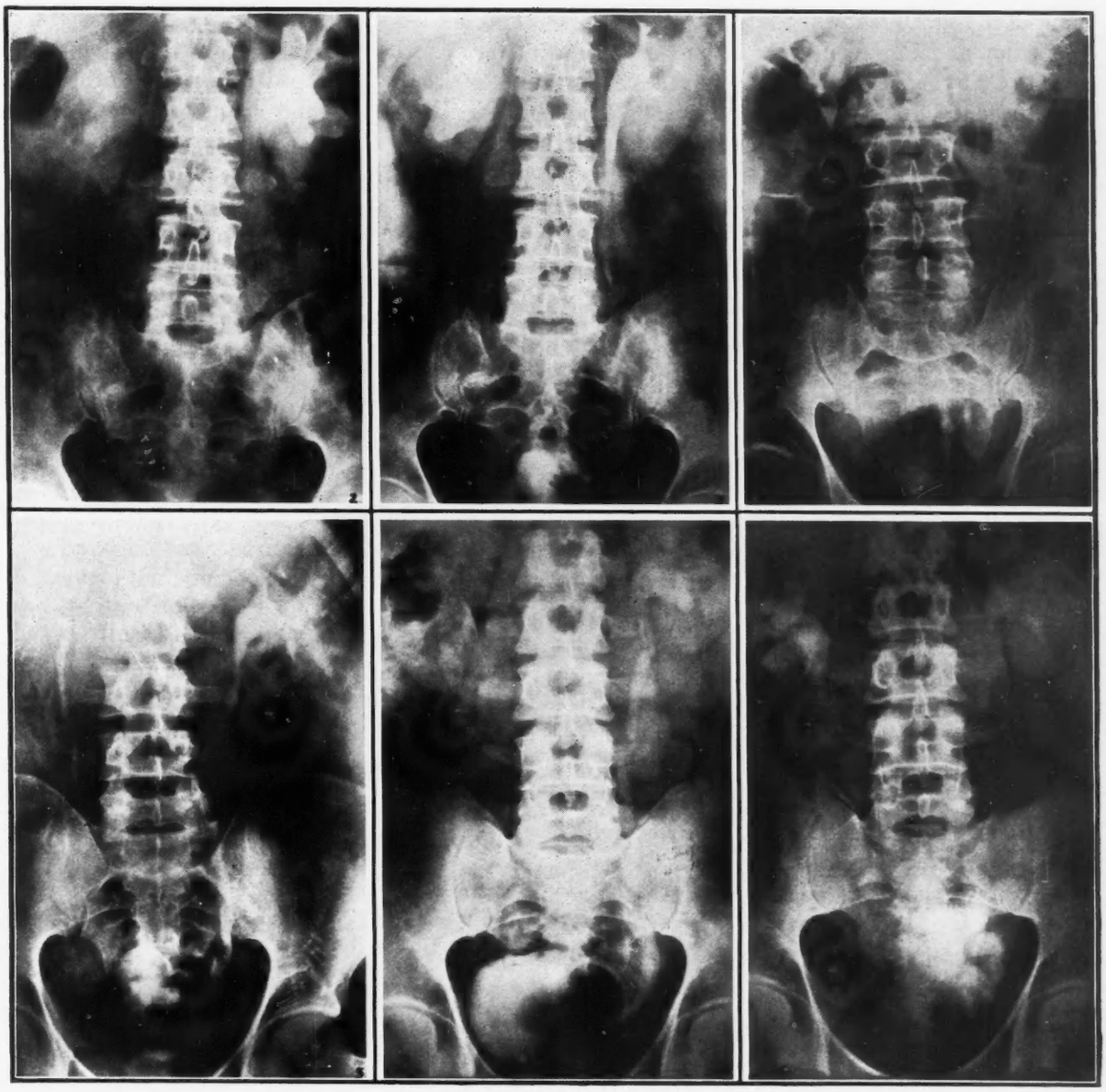

Fig. 2. Case 2.—Excretory urogram before uretero-sigmoid anastomosis. *Note* hydroureter and hydronephrosis. **Fig. 3.** Case 2.—Excretory urogram ten months after uretero-sigmoid anastomosis. *Note* decrease in hydroureter and hydronephrosis. **Fig. 4.** J.S—Excretory urogram seven years after uretero-sigmoid anastomosis and cystectomy. **Fig. 5.** E.W.—Excretory urogram two years after uretero-sigmoid anastomosis and cystectomy. **Fig. 6.** B.—Pre-operative urogram. **Fig. 7.** B.—Excretory urogram twelve months after operation.

the fourth day with asthma and auricular fibrillation, but we think he had some retro-peritoneal infection also, as he was a little tender low down in the pelvis and had some abdominal distension. There was no autopsy in either of these cases.

The survivor was a sheet metal worker (B.), 41 years of age, with a very extensive tumour and left hydronephrosis. Two silk stitches were passed on the left side to ensure if possible a large fistula. On the right side the mucosa of the bowel was inadvertently opened in making a trough. This accident had happened more than once in the Coffey 2 technique patients without apparent ill effects, but in this case a retro-peritoneal abscess formed which on the twelfth day broke through the abdominal incision. At the same time he began to pass urine per rectum. In due course cystectomy was done; two weeks after operation a supra-pubic urinary fistula developed which drained for about six weeks. A lymph gland removed with the bladder showed metastasis and the patient died sixteen months after the cystectomy. He was able, however, to superintend and lend a hand at his shop for nine to ten

months. Fig. 6 shows the urogram before operation, and Fig. 7 one year after.

Note that the hydronephrosis on the left side is reduced following the anastomosis. On the right side the post-operative hydronephrosis is without doubt due to fibrosis after post-operative abscess.

Of the five survivors among the eight patients operated upon by the Coffey 1 technique, the first was the Indian woman whose history has been given. The second patient began to go blind six months after cystectomy. A metastatic tumour was suspected, but exploration revealed fibrosis in the arachnoid tissue around the optic nerves. She is gaining weight and shows at eighteen months no evidence of malignancy. The third patient died, cause unknown, one month after her return home. The fourth and fifth are recent cases so far in the best of health.

The three casualties among the 8 patients on whom the Coffey 1 technique was used all showed sepsis at or adjacent to the anastomosis. In one case, a man of 49 who died on the fifth post-operative day, we found at autopsy that the terminal end of the ureter had become gangrenous, with the adjacent portion lying loosely in the submucous tunnel. A passage was thus established which permitted leakage from the lumen of the bowel to a small retro-peritoneal abscess.

Another patient, a man of 72 who died on the fourteenth post-operative day, was found at autopsy to have a small retro-peritoneal abscess in front of the sigmoid midway between the two areas of anastomosis. The ureters appeared to be united securely to the bowel, but on opening the bowel a long necrotic end of the ureter was found attached to the mucosal end of the tunnel. A probe could be passed without difficulty up each ureter, but could also be passed between the ureter and the wall of the bowel as far as the peritoneal coat, but no farther. This condition, however, differs only in degree from the previous case where a probe could be passed from the lumen of the bowel alongside the ureter into the abscess cavity outside. Without a doubt the spread of infection was by the same route. Also both cases showed an acute ascending ureteritis and suppurative pyelonephritis.

The third patient, who died seven days after operation, had a localized peritonitis adjacent to the extra-peritonealized area, with a localized abscess under the posterior layer of the peritoneum. In spite of the abscess in the region of the anastomosis both ureters were firmly healed along the entire length of their respective tunnels and there was no pyelonephritis. It is essential not to make the tunnel in the submucosa too large for the ureter, and if the ureter is dilated, to err rather on the small side; a dangerous "dead space" will thus be avoided.

SUMMARY

A review of 122 cases of infiltrating tumour of the bladder. Partial cystectomy 36 cases; cystotomy and diathermy 29 cases; cystotomy, diathermy and radon 39 cases; uretero-sigmoid anastomosis and cystectomy 18 cases.

The office of apothecary is of very ancient date. The Greek and Roman physicians were their own apothecaries, and when they ceased to act in that capacity is not exactly known. Conring asserts (De Antiquitatibus academicis) that the physicians in Africa first began to give up the preparation of medicines as early as the time of Avenzoar, in the eleventh century. This accounts for many Arabic terms of art being introduced into pharmacy and chemistry, and explains why the first known apothecaries were in the lower part of Italy and their first legal establishment in the kingdom of Naples.

RECURRENT SUBARACHNOID HÆMORRHAGE DUE TO AN ARTERIAL ANGIOMA OF THE CEREBELLUM AND BRAIN-STEM*

BY J. C. RICHARDSON AND A. W. BAGNALL

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THE following case is reported because of its importance in demonstrating a cause of spontaneous subarachnoid hæmorrhage in childhood. It also points out the value of auscultation of the skull as a routine in neurological examination.

CASE REPORT

A young Hebrew male, aged 23, was admitted unconscious to the Toronto General Hospital on November 7, 1938; he died on November 13, 1938. The following history was obtained from his parents and from hospital records.

His birth and early development were normal and he was a healthy child until the age of seven years. At that time he suddenly complained of headache, and a few hours later collapsed while walking upstairs. For two days he suffered left-sided headache, stiffness of the neck, drowsiness, and feverishness, and was then admitted to a hospital. Examination showed an acutely ill child with severe rigidity of the neck and back. The tendon reflexes were sluggish but there were no localizing neurological signs. The cerebrospinal fluid was blood-stained and under slightly increased pressure. Lumbar puncture was repeated on five occasions and the fluid became progressively clearer, being free of blood after two weeks.

Three months after the first attack the patient suffered a gradual recurrence of headache. Again gross blood was present in the cerebrospinal fluid. There was mild papillœdema. On this occasion he walked unsteadily, deviating to the right, showed a bilateral horizontal nystagmus and some inco-ordination of the right arm. He recovered from this attack and apparently was well until four months later, when he developed a sudden, severe headache and stiff neck, much the same as the first attack. Examination in hospital showed head retraction, neck rigidity, and positive Kernig's sign. The cerebrospinal fluid was deep cherry red but returned to normal colour within three weeks. Only slight unsteadiness of gait and lateral nystagmus remained after convalescence.

A fourth admission to hospital occurred nine months after the first. On this occasion there had been a sudden loss of consciousness preceded by a scream. Examination showed signs of meningeal irritation and papillœdema with numerous fresh retinal hæmorrhages. Three weeks later, just as the patient was returning to his normal health and the blood was disappearing from the cerebrospinal fluid, he again screamed and lost consciousness. Fresh blood was found in the cerebrospinal fluid and there was an increase in the number of retinal hæmorrhages. Uneventful recovery took place and the patient was discharged from hospital exactly one year after the first onset of symptoms. For the next four years, until the age of 12, he was under observation as an out-patient. During that period he was free of symptoms and no neurological signs were noted.

For a period of fifteen years, from eight to twenty-three years of age, the patient was well and carried on a normal life as a student and later as a plumber's assistant; for the last eleven years he had not been under medical supervision.

About October 15, 1938, he began to have headaches and pain in the right lower jaw. Headaches were present frequently from that time, though not of disabling severity. About November 1st, he began to notice blurring of vision in the left eye. On the morning of November 6th, he went back to bed complaining of general weakness. A few hours later weakness and numbness of the left arm and leg developed; the weakness increased rapidly and the affected limbs became stiff. Early in the evening he began to vomit. At midnight he became unconscious and was brought to the Toronto General Hospital.

Physical examination.—On admission to hospital the patient was in a state of deep stupor from which he could be roused slightly by painful stimuli. Temperature 102° per rectum; pulse 90. There was fairly severe rigidity of the posterior cervical muscles and Kernig's sign was present bilaterally. He was lying in an abnormal posture, the left arm rigid and slightly abducted. The elbow and fingers were extended and the whole arm was slightly pronated. The left leg was rigidly extended at the knee and the foot plantar-flexed. The right arm and leg moved freely when pricked with a pin; there was no voluntary movement of the left limbs. Involuntary tonic spasms occurred every three or four minutes. With these spasms the head rotated fully to the left and there was a marked accentuation of the rigidity and posture of the left arm and leg. The arm would become very rigid in the posture of extension and internal rotation, the wrist flexed and the fingers adducted and extended. The tonic extensor posture of the left leg would become extreme. The spasms lasted three or four seconds and subsided without any clonic movements.

On examination of the cranial nerves the fundi appeared normal; the visual fields could not be tested. There was a slight external squint of the left eye. Both pupils were small, the left a little larger than the right; neither reacted to light. The left corneal reflex was absent, the right sluggish. There was response to pin prick over the right side of the face but not on the left. No facial weakness was evident. Pharyngeal reflexes were present. There was no wasting of the tongue. A left hemi-analgesia was indicated by lack of response to pin prick over the left arm, leg, and trunk. There was response to painful stimuli on the right side. Sensation could not be tested further. Tendon reflexes were hyperactive throughout the left arm and leg but only moderately active on the right. A painful stimulus anywhere over the sole or dorsum of either foot produced a complete fixation withdrawal reflex of the whole limb.

Clinical examination of the scalp and skull showed no tenderness or deformity. Auscultation revealed a systolic bruit, which was loud in the right occipital region and over the right eyeball. The bruit could be faintly detected over other regions of the skull and over the left eyeball. In the right supraclavicular fossa over the common carotid artery there were a palpable systolic thrill and a very loud, rough, systolic bruit. On palpation the carotid arteries appeared to be equal in size on each side. A loud, systolic murmur could be heard over the right occipital artery. This vessel was pulsating forcibly and felt larger than the left occipital artery. Digital compression of the right common carotid artery almost completely obliterated the bruit over the occipital artery as well as over the skull and eyeballs. The murmur was also diminished by compression of the right occipital artery; it was not affected by compression of the left carotid and occipital arteries.

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Examination of the heart, chest and abdomen showed no significant abnormalities. The heart was not enlarged, and the sounds were normal and regular. There were faint, blowing, mitral and pulmonary systolic murmurs. It is worthy of note that the loud systolic murmur heard in the neck was not a transmitted cardiac valvular murmur. His blood pressure was 140 systolic and 60 diastolic. Hæmatological examination showed only a moderate leukocytosis of 12,600. Lumbar puncture yielded grossly bloody cerebrospinal fluid under a pressure of 370 mm. of water. Centrifuged supernatant fluid was deep yellow in colour.

X-ray photographs of the skull showed slight calcification just inside the inner table of the skull in the right lateral wall of the posterior fossa.

Progress.—On November 8th, the day after admission to hospital, the patient's general condition improved slightly and he was in a semi-conscious state, able to answer simple questions. He complained of a right-sided headache. The tonic spasms had ceased and the rigidity was less marked in the left arm and leg. The pupils were now small and equal, and completely inactive to light. There was early papillœdema. The cerebrospinal fluid continued to be very bloody and xanthochromic. He remained in the same condition for two days, then on November 10th lapsed into deep unconsciousness accompanied by rapid, stertorous breathing. His temperature rose rapidly to 104° on November 11th and 107° on November 12th. There were definite signs of pneumonia in the left lower lobe. Lumbar puncture on November 12th showed the cerebrospinal fluid to be free of fresh blood but deeply xanthochromic, and under a pressure of 330 mm. of water. The patient died on November 13th. In the terminal stage all four limbs were flaccid and motionless.

Summary of the clinical findings, and diagnosis.—This patient had suffered five apoplectiform attacks in one year at the age of seven to eight years. Following that period he remained well for the fifteen years prior to his last illness. The earlier attacks were characterized by sudden, violent headaches, and on two occasions by sudden loss of consciousness. Examination on each occasion showed signs of meningeal irritation and fresh blood in the cerebrospinal fluid. He was found to have nystagmus, and on one occasion showed some incoordination and an ataxic gait with a staggering to the right. Findings characteristic of spontaneous subarachnoid hæmorrhage with a suggestion of transient local involvement of the right cerebellar hemisphere or cerebellar connections were, then, presented during the patient's childhood illnesses. At the time of these earlier attacks the diagnoses were hæmorrhagic meningitis and purpura, on different occasions. There is no record of auscultation of his skull during his early attacks nor did the patient ever complain of a noise in his head. His terminal illness was gradual in onset, featured by headache for two weeks, then by a left hemiplegia developing in a period of a few hours and followed by loss of consciousness. Subarachnoid hæmorrhage was again evident by the findings of neck rigidity, positive Kernig's sign, and blood in the cerebrospinal fluid. Local hæmorrhage into the midbrain was suggested by pupillary changes and an external strabismus. The spastic paralysis of the left arm and of both legs, with the flexion withdrawal reflexes of the legs, suggested a severe involvement of both pyramidal tracts. These findings along with the occurrence of tonic fits were features suggestive of decerebrate rigidity. The finding of a bruit over the skull, eyeballs and neck was an important clue indicating an abnormal arteriovenous communication within the skull. Clinically, the case was considered to be an arterial angiomatous malformation at the base of the brain with hæmorrhage into the subarachnoid space and also into the midbrain.

Autopsy findings.—Autopsy was performed on November 13, 1938, five hours after death. The body was that of an undernourished, moderately developed, young male, weighing 113 pounds. Apart from acute bronchopneumonia of the aspiration type, involving the left lung, there were no pathological changes outside of the cranium. The heart weighed 285 grams and in all respects was normal in appearance. No difference could be demonstrated at post-mortem examination between the right and left common carotid and occipital arteries, though during life those on the right side were pulsating more forcibly.

When the cranial contents were exposed there was a moderate amount of recent, diffuse subarachnoid hæmorrhage, most marked in the posterior fossa. In this region a few fine, filmy, fibrous adhesions fixed the right cerebellar hemisphere to the dura.

On removal of the brain the distal half of the right lateral sinus was found to be very large and filled with fluid blood. Behind this the floor of the posterior fossa was excavated over an area about 3 cm. in diameter. Filling this hollow and massed over the opposing surface of the right cerebellar hemisphere was a great plexus of tortuous, dilated, blood-filled, anastomosing vessels. The right cerebellar hemisphere was only about two-thirds the size of its normal partner. The folia subjacent to the plexus of vessels were scarred by gliosis and showed many patches of brown pigment.

At the base of the brain, the pia-arachnoid was somewhat thickened in the region of the interpeduncular cistern and the optic chiasma. While the arteries of the circle of Willis were normal, the right vertebral artery was somewhat larger than the left. The rather large basilar artery was pushed to the left by the tangle of vessels under the right cerebellar hemisphere and supplied

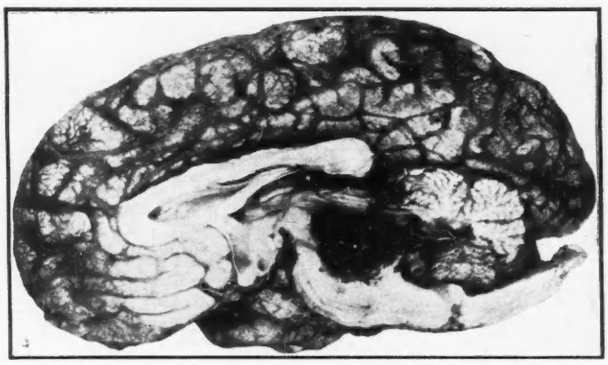

Fig. 1.—The medial surface of the right half of the brain as seen after sagittal section. Large thin-walled angiomatous vessels are seen in the cerebellar vermis and upper pons. There is recent hæmorrhage in the dorsal part of the pons and midbrain. Hæmorrhage also extended into the right cerebral peduncle.

the plexus with large, thin-walled arteries of irregular calibre which corresponded in position to the usual superior and anterior and posterior inferior cerebellar arteries of the right side. The tangle of anastomosing vessels extended from the inferior aspect of the right cerebellar hemisphere and pons around the right side of the brain-stem enmeshing the right trigeminal nerve and appeared again on the upper surface of the right cerebellar hemisphere and brain-stem. Most of these vascular channels were thin-walled but several showed occasional plaques of fibrous thickening.

On section of the brain, angiomatous vessels were seen to extend into and to honeycomb the vermis and the inferior part of the right cerebellar hemisphere as well as the right side of the pons and lower midbrain (see Fig. 1). There was a large area of recent hæmorrhage in the dorsal part of the pons and midbrain (see Fig. 2). One large vessel overlying the fourth ventricle was thrombosed.

Microscopic examination.—With the exception of evidence of acute bronchopneumonia of the aspiration type, the only histological changes found in the course of routine sectioning of the organs were in the central nervous system.

A few of the vessels composing the vascular malformation in the posterior fossa were recognizable as somewhat distorted arteries or, in some cases, veins. The rest had walls of variable thickness, composed mainly of fibrous tissue with only a scattering of smooth muscle fibres. With special stains some of these fibrous-walled vessels were seen to have a definite internal elastica but, in most, the elastic tissue was shredded throughout the wall. Variation in thickness of the walls was occasioned by plaques of fibrous tissue, internal to the elastic tissue in some cases, external to it in others. In some instances the elastic tissue itself formed a thick plaque.

Large numbers of these abnormal vessels were situated in the arachnoid in the positions noted in the macroscopic examination and they extended in this position between the folia of the cerebellum. In addition, however, they were found within the nervous tissue of the cerebellar vermis and brain-stem as discrete channels separated by somewhat gliosed but easily recognizable nerve tissue. In such areas there was no suggestion of the structure of an angioblastic tumour. The architecture of the right cerebellar hemisphere was maintained much better than the gross appearance would suggest. In the region of the angioma there was evidence of old and recent hæmorrhage in the subarachnoid space and in the adjacent, rather gliotic, nerve tissue. Though the exact point of rupture was not seen, the hæmorrhage appeared to have arisen from a large thin-walled angiomatous vessel in the dorsal part of the upper pons.

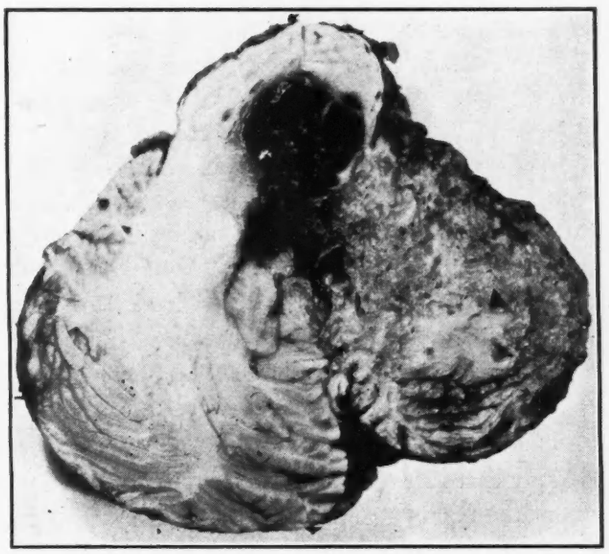

Fig. 2.—A horizontal section has been made through the centre of the cerebellar hemispheres, the middle cerebellar peduncles and the pons. The right cerebellar hemisphere is grossly shrunken. Angiomatous vessels and recent hæmorrhage are seen in the pons and the right cerebellar peduncle.

Sections from the cerebral hemispheres and spinal cord showed evidence of recent subarachnoid hæmorrhage but there was relatively little in the way of subarachnoidal adhesions and old blood pigment to show for the repeated flooding of blood into the subarachnoid space in years past.

DISCUSSION

Spontaneous subarachnoid hæmorrhage is a common disease in adults, and, with rare exceptions such as the case reported here, is caused by rupture of a berry aneurysm of the circle of Willis. In the five year period from 1934 to 1938, autopsies have been performed on 25 cases of spontaneous subarachnoid hæmorrhage from the Toronto General Hospital. In 22 there was rupture of a saccular aneurysm; in the case reported here there was rupture of an angiomatous malformation; in the remaining two cases the bleeding point was not found.[1] Though we have not comparable data, it is known that both fatal subarachnoid hæmorrhage and berry aneurysm are rare in children. It seems probable that angiomatous malformation, which is a rare cause of subarachnoid hæmorrhage in adults, ranks much higher as a cause of subarachnoid hæmorrhage in children.

When the syndrome of spontaneous subarachnoid hæmorrhage is encountered, particularly if the victim be a child, the possibility of an arterial or venous angioma should be considered and investigated. The case reported here illustrates the importance and value of auscultation of the skull. Except in infants, cases of severe anæmia, and traumatic arteriovenous aneurysm, the presence of a cephalic bruit is almost pathognomonic of a cerebral arterial angioma. (Here we are following the nomenclature of Cushing,[2] meaning an anomalous network of cerebral vessels, chiefly arterial, in which direct arteriovenous anastomoses occur.) A bruit has been heard so rarely in cases of saccular aneurysm of the circle of Willis that the finding of a head murmur almost contradicts that diagnosis. In the case reported above the relative loudness of the bruit over the common carotid artery was rather puzzling. At autopsy there was no local cause for the neck murmurs and it is probable that they were transmitted backwards from the intracranial site of arteriovenous communication. The right occipital artery had apparently entered into the supply of the angioma by way of a meningeal branch through the jugular foramen. However, at autopsy, it seemed that the main origin of the angiomatous arteries was through the vertebrals, and it is surprising that compression of the carotid or occipital artery was so effective in decreasing the bruit.

Meningeal hæmorrhage has been reported in cases of arterial and venous cerebral angioma by Cushing,[2] Bagley,[3] Vincent and co-workers,[4] Buckley,[5] Power[6] and others. These malformations occur most commonly on the surface of the cerebral hemispheres, particularly in the parietal region. They usually manifest themselves clinically by hemiplegic signs, sensory or visual defects, Jacksonian attacks and pressure symptoms.

Migrainous attacks with unilateral headache and visual phenomena may occur, as in the case reported by Hyland and Douglas.[7] Vincent, Hartmann and Delaitre[4] have reported recently two cases of repeated meningeal hæmorrhages from arterial angioma. These were each located in the parietal region of the cerebral hemispheres; one showed calcification, and both were demonstrated by arteriography with thorotrast. One of their patients showed a small retinal angioma. Neither presented a bruit of the head. Their first case presented a similar clinical history to ours. The patient, a boy aged 18, was admitted with a severe subarachnoid hæmorrhage, and gave a history suggesting three previous severe hæmorrhages at ten and seventeen years of age. Their second case, a man aged 38, had suffered a sudden illness followed by a left hemiplegia at the age of eight. At thirty-five years of age he had an acute illness called "meningitis". Both of these attacks obviously were intracerebral and subarachnoid hæmorrhages from the angioma; this was demonstrated after his last attack of subarachnoid bleeding at the age of thirty-eight. In these two cases, the presence of calcification and the absence of bruit suggest that the malformations may have been venous rather than arterial angiomas. The authors emphasized the importance of searching for an angioma when repeated subarachnoid hæmorrhages occur in a young, non-hypertensive and non-syphilitic individual. They drew attention to the rarity of such cases since symptoms of angioma are seldom seen before thirty years of age and are more commonly hemiplegic and convulsive than hæmorrhagic. However, there are now several reported fatal cases of hæmorrhage from cerebral angioma, and Cushing has suggested that hæmorrhage is a common terminal episode. In our records there have been two other fatal cases of subarachnoid hæmorrhage from angioma. One of these, a girl aged fourteen,* showed a venous angioma in the upper midbrain. The other was a woman aged forty-four who died two hours after the onset of symptoms. Post-mortem examination showed a venous angioma of the right thalamus from which massive hæmorrhage had occurred into the third ventricle and subarachnoid space.

In general, it may be said that angiomas of the brain are uncommon, whereas angiomas of the cerebellum (exclusive of vascular neoplasm) are decidedly rare. Cushing has reported 14 cases of arterial and venous angiomas and 12 of these were in the cerebral hemispheres, most of them being in the distribution of the middle cerebral artery. One case which was not verified by operation or autopsy presented signs of a cerebello-pontine angle tumour, with the addition of a loud cephalic bruit. There was only one verified case of an angiomatous malformation of the cerebellum. That was in a man of thirty-two whose presenting symptoms were those of increased intracranial pressure and mild cerebellar signs. The diagnosis was cerebellar tumour until operation revealed a tangled network of large pulsating vessels in the left cerebellar hemisphere, which was considered to be an angioma arteriale. On one occasion, two years after operation, a faint systolic bruit was heard over the site of decompression. At that time Cushing was able to find reference to only five cases of cerebellar arterial angioma, three of which had been diagnosed only at operation for cerebellar tumour, and two were unexpected post-mortem findings.

In our cases it is of interest that there was no evidence of any significant damage caused directly by the numerous preceding subarachnoid hæmorrhages. This is in keeping with clinical experience at the Toronto General Hospital where the view is favoured that repeated spinal drainage should not be used as a routine in the treatment of spontaneous subarachnoid hæmorrhage.

SUMMARY

A case of arterial angioma of the cerebellum and brain-stem is reported. Repeated subarachnoid hæmorrhages had occurred in childhood, many years before a terminal subarachnoid and brain-stem hæmorrhage. There had been no focal pressure symptoms other than those related to the hæmorrhages.

A faint cephalic bruit heard on careful auscultation of the skull was an important diagnostic finding.

The possibility of an angiomatous malformation should be kept in mind in any case of spontaneous subarachnoid hæmorrhage. Angioma probably is one of the commonest causes of massive subarachnoid hæmorrhage in young

* This was a patient of Dr. H. McGarry, Niagara Falls, Ont.

childhood. Berry aneurysms explain the majority of adult cases.

The pathological features of the vascular lesion in this case were typical of angioma arteriale. Such angiomatous malformations occur very rarely in the cerebellum and are much more commonly situated in the cerebral hemispheres. In any site, a cerebral angioma may produce symptoms by hæmorrhage as well as by local pressure.

The authors wish to thank Professor Duncan Graham for permission to report this case, and also Professor Linell for his assistance and permission to use the illustrations.

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ABDOMINAL AORTIC MYCOTIC DISSECTING ANEURYSM*

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WITHIN the last few years several papers[1] have appeared stressing the possibility of ante-mortem diagnosis of aortic dissecting aneurysm through definite clinical criteria. At best this is difficult to do, for while the differential diagnosis covers few points it is inherently confusing. This is more so when the situs is the abdominal rather than the aortic aorta. An understanding of the pathogenesis of the lesions preceding dissecting aneurysms indicates that certain of these cases may be identified during life, but some are so masked by attendant circumstances that only necropsy can prove their existence.

This latter fact is demonstrated by a case recently observed in the McGill Pathological Institute. Even gross examination of such a case does not always point to the mode of origin. In this location, in the abdominal aorta, arteriosclerosis is the commonest causative factor and most likely of recognition, though trauma should also be self-evident. Tuberculosis is never, and rheumatic granulomatous formations, rarely, are responsible in this part of the aorta. Syphilis, disputed by many[2] as an underlying cause in dissecting aneurysms, is fairly suggestive. A proved case is found in our museum collection of dissecting aneurysms, once in 12 specimens. Periarteritis nodosa and mycotic aneurysm are very uncommon and require careful histological study, as does idiopathic medionecrosis which now appears to be recognized more frequently. Its site of predilection is, however, the ascending part of the arch of the aorta.

The case to be cited indicates the necessity for accurate gross examination and microscopy. It therefore offers an opportunity to review briefly the pathogenesis of abdominal dissecting aneurysms.

* From the Pathological Institute of McGill University, Montreal.

CASE REPORT

This 59-year-old male was referred to the Montreal Neurological Institute, March 25, 1939. His complaints were (1) moderate pain in the lower part of the back, radiating down the right leg, duration 2 months; (2) swelling and soreness of the right knee for 5 days; (3) chills on several occasions within a week of admission, and (4) jaundice for 24 hours. Nine days before he had been discharged from the Notre Dame Hospital, where for 5 weeks he had been treated for arthritis. His only other hospital admission had been at the same institution 15 years ago for a head injury.

The patient's personal, past and family history was not helpful. The present illness alone seemed of importance. Up until 6 months before he was employed, doing hard labour and feeling quite well. He then began to complain of (1) vague frontal headache, (2) anorexia, (3) mild dyspnœa on exertion, and (4) backache of moderate degree. This was followed during the last 2 months by increasing pain in the right leg. With it there was a general feeling of weakness. Hospitalization followed, as noted previously.

On this admission, physical examination showed a middle-aged, well-nourished, stuporous, icteric male. Dullness and râles were elicited over the bases of both lungs. The size of the heart and the sounds were normal. Blood pressure, 140/80. The liver was palpable. The right knee was swollen, red, tender and in partial flexion.

Neurological examination.—Right ptosis, absent left knee jerk, possible left facial weakness, and slight papillœdema. Temperature 103.2°, pulse 80, and respirations 24.

Laboratory data.—White blood cells, 30,000; urine, albumin ++; Wassermann, anticomplementary; non-protein nitrogen, 72 mg. per cent; bilirubin, direct 6.7 mg. per cent, indirect 8.75 mg. per cent; cerebrospinal fluid; initial pressure 120, fluid clear; Pandy +; Lange 0001221000. X-ray of the chest suggested bronchopneumonia, and of the right knee, fluid in the joint space.

A diagnosis was made of septic arthritis with probable septicæmia and hæmolytic jaundice. The following day B hæmolytic streptococci were recovered from the fluid in the right knee joint, but the blood culture was negative. Three days later the patient died.

Autopsy protocol (A 91-39).—External examination showed the body to be that of a poorly nourished white male, 167 cm. in length. Rigor mortis was absent and post-mortem lividity present. The skin was slightly icteric. The pupils were round and equal; external canals and nose clear; mouth edentulous. The thorax was symmetrical and the abdomen distended. There was a small puncture wound on the lateral aspect of the right knee. The knee was swollen, moderately hard on palpation, and gave the sensation of a fluctuant mass being within it.

On opening the thorax, the transverse precordium measured 14 cm. and the pericardium 15 cm. There were dense adhesions in both pleural cavities, and each cavity contained about 200 c.c. of grossly bloody fluid. Posteriorly, in the left mediastinal area were found two large encapsulated blood-clots. Throughout its whole length the mediastinum was widened by clotted blood, slightly laminated peripherally. On the left side near the diaphragm older organized clots were found.

The left lung weighed 400 g. and the right 500 g. The surfaces were roughened and covered with fibrin. Both were subcrepitant and subelastic. On section, the left upper lobe was reddish grey and air-containing, while the lower lobe was dark red and œdematous. This surface oozed bloody fluid. Bronchi were clear and pulmonary vessels patent. The right lung was similar but showed less involvement of the lower lobe. The peritracheal lymph nodes were small, black and hard.

The heart weighed 400 g. The pericardium was intact. A blood culture was taken. The right auricle was slightly dilated as well as the right ventricle. The tricuspid valve measured 10.5 cm. and the pulmonary valve 7.5 cm., both being intact. The mitral valve measured 9.5 cm. and showed minimal sclerotic thickening along the free edges of the cusps. This was also true of the aortic valve, which measured 7.5 cm. The left ventricular wall was firm, red and 2 cm. in thickness. The endocardium was smooth. The sinuses of Valsalva were free and the coronaries patent. Numerous atheromatous plaques were found in the ascending portion and arch of the aorta. At a point 12 cm. from the arch on the left side of the aorta the adventitia formed a blood-filled mantle, 2.5 x 2 cm. This out-pouching was continuous with the true dissecting aneurysm that extended 6 cm. below the superior mesenteric artery. The internal rupture was 5 cm. below the diaphragm, 2 cm. in length, transverse in direction, and its edges were ragged. The surrounding intima was yellow and contained some small atheromatous ulcerations. Some calcifications were present below this level. Marked extravasation of blood was found along the course of the hepatic, duodenal, gastric and splenic arteries, but limited to peritoneum and adventitia, and directly connected with the periaortic hæmorrhage.

The spleen weighed 200 g. It was soft, grey and its lower pole occupied by a circular, necrotic area, 2.5 x 2 cm. The pulp scraped away readily on cut section. The large and small bowel, stomach, œsophagus, pancreas and adrenals were intact. The left kidney weighed 150 g. and the right 175 g. Both were deep purple. The capsules stripped with some difficulty, exposing a finely granular surface with small yellow nodular elevations containing a greyish material. On cut section these were found only in cortex which was well defined from the medulla. Pelves, ureters, bladder and prostate were normal. The liver weighed 1,700 g., was light brown, grossly, and nutmeg in appearance on cut section. Gall-bladder and bile ducts were free.

The right knee joint was opened and a culture taken from the thick, yellow, purulent material found within the cavity. Bone marrow from the upper third of the femur was soft and light red.

The scalp and calvarium were normal. The dura was not thickened. The brain weighed 1,280 g. The hemispheres were symmetrical and the convolutions and gyri normal. The basilar vessels were slightly thickened. On section, after formalin fixation, the brain and cord were found normal. In the left ear the drum was deformed and in the middle ear was found a thin yellowish exudate (cultured, but unfortunately lost).

Bacteriology.—Heart's blood culture gave *S. hæmolyticus (beta).* Right knee joint culture, *S. hæmolyticus (beta).* Splenic abscess culture, *S. hæmolyticus (beta).*

Histology.—Diagnosis only is given, except on sections of aorta. Heart: myocardial hypertrophy with interstitial fibrosis. Lungs: passive congestion and productive pleurisy. Spleen: multiple abscesses. Kidneys: multiple cortical adenomata; cortical abscesses and arteriosclerotic infarction. Right knee joint: exudative purulent synovitis. Thyroid, liver, pancreas, left adrenal, prostate, left femur, bone marrow, brain, cord and pituitary, all normal.

Aorta: Sections taken above the aneurysm showed two distinct features. In the first instance, the intima bulged and contained, in addition to hyaline thickening, heavy deposits of cholesterol crystals. The sections stained for fat showed abundant globules in these regions as well as in the media. The second observation in the media was that of transverse areas of scarring, usually about small vascular channels and represented by fibroblastic cellular proliferation. In the adventitia, about the vasa vasorum there were large aggregates of closely packed lymphocytes. Endarteritis obliterans was minimal. *Diagnosis:* Arteriosclerosis and syphilitic aortitis.

In the sections from below the aneurysm there were occasional atheromatous plaques and irregular calcification. The media showed extensive destruction of elastic fibres, slight hyaline replacement, and myriads of polymorphonuclear leucocytes in various stages of degeneration. Here small foci of bacteria were also found. The adventitia contained small extravasations of red blood cells. The section as a whole was a miniature of what was seen and recorded in the section through the aneurysm.

Sections through the area of perforation disclosed little remaining recognizable intima. The media was packed with degenerating leucocytes, red blood cells, and fibrin. This inflammatory process destroyed and replaced whole bundles of elastic and collagenous fibres. It extended between the media and adventitia. Blood escaped into the surrounding tissues. In vasa vasorum and larger vascular channels of the media and adventitia there were clusters and chains of cocci (Jensen stain). Sometimes the leucocytes grouped in abscess fashion. *Diagnosis:* Septic medial necrosis with mycotic dissecting aneurysm.

COMMENT

It is impossible to explain the pathogenesis of this dissecting aneurysm on a basis of the gross anatomical changes alone. Even the microscopic sections at first further complicate the unravelling of the case. In spite of the location of the perforation in the abdominal aorta, arteriosclerosis cannot be implicated from the gross findings, for it is minimal in this instance. Sections from this, however, show deep coalescent atheromatous ulcerations destroying por-

tions of intima and media, indicating rather strongly an arteriosclerotic background. The histological identification of unsuspected syphilis adds another distinct possibility. This is particularly true in the elastic tissue stains revealing irregular breaking of fibres in the media about focal areas of scarring.

The linear expansive areas of necrosis involving chiefly the media, under low power magnification, readily call to mind idiopathic medionecrosis. Higher power studies rule this out, for the earlier characteristic degenerative and cellular proliferative features of this condition are absent, notably in regions removed from the rent in the aorta.

Study of the necrotic areas (Figs. 1, 2, 3) shows the medial elastic and collagenous fibres entirely degenerated, only wisps of fibres and rims of nuclei remaining. The great bulk of cells are polymorphonuclears, occasionally lymphocytes and plasma cells, with groups of red blood cells and a delicate webbing of fibrin. Great numbers of cocci, often in chains, are present in and about the vasa vasorum. The process is acute and inflammatory in character.

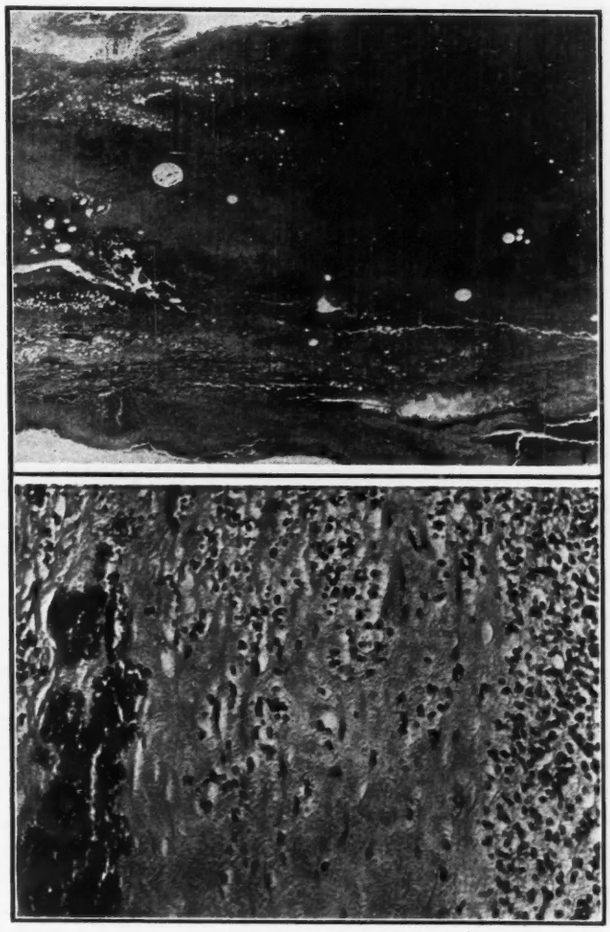

Fig. 1.—Low power survey indicating destruction of all coats with pooling of blood in the vessel wall. **Fig. 2.**—From the media, showing clumps of bacteria in vasa vasorum, fragmentation and degeneration of fibres, large numbers of polymorphonuclears streaking between remaining fibres and lack of evidence of repair, indicating an acute episode.

While arteriosclerosis and syphilis are both present in this aorta they were not underlying factors in the dissection. The formation of the dissecting aneurysm resulted from the septic medial necrosis. Arteritis may originate in the intima of vessels as bacteria settle there while *en route* through the lumina. This may also occur as bacterial emboli are discharged as in subacute bacterial endocarditis (absent in this case). Arteritis may in unusual instances arise by bacteria lodging first in the vasa vasorum, with subsequent spread throughout the coat provoking an inflammatory response. Such has been the event here. The organisms in the ear are unknown. Their relation to the bacteria isolated remains pure speculation. However,

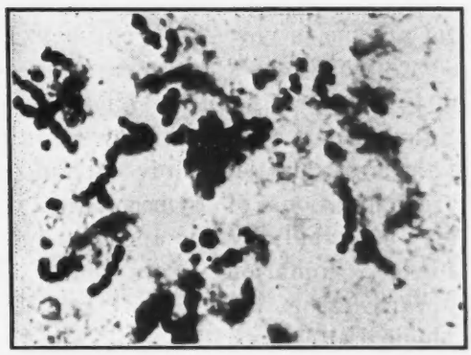

Fig. 3.—From the aggregation of bacteria in section 2 showing them all to be cocci, frequently occurring in short chains.

the right knee joint, containing B hæmolytic streptococci, did serve as the immediate source from which the septicæmia developed. These organisms were responsible for the production of the aortitis with medial necrosis, intimal rupture, and formation of this rare mycotic form of dissecting aneurysm.

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PRIMARY CARCINOMA OF THE FALLOPIAN TUBE*

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HISTORICAL REVIEW

ANY condition of which almost 400 cases have been reported and only one diagnosed before operation warrants reviewing. Robinson[1] states that Raynaud in 1847 reported the first case of primary carcinoma of the Fallopian tube, and that Rokitansky, in 1861, made the first pathological description. The majority of writers give priority to the first paper on the subject by Orthmann,[9] who described the condition clinically in 1886. Peham,[1] Vest,[1] Wharton and Krock,[1] Lockyer,[6] Bower and Clark,[2] Wechsler,[9] Kahn and Norris,[3] Charache, and Phaneuf[4] have added to the growing list, making a total of 349 cases reported by 1935. Since 1935, 13 more have appeared in the literature,[12] and with the present reported instance the total number is now 363 (February, 1939). At the rate which cases are being reported at present, twice as many will have been reported during the second quarter of this century as during the first quarter. More careful pathological examinations of gynæcological specimens may contribute to this apparent increase in incidence. Robinson[1] states that the frequency varies from 0.03 to 0.31 per cent of gynæcological affections. Wharton and Krock[1] found only 5 out of 35,000 gynæcological admissions at Johns Hopkins Hospital. In 1917 Kahn and Norris[3] stated that primary tubal carcinoma was one hundred times as rare as carcinoma of the uterus.

ETIOLOGY

Age.—Johnson and Miller[8] have reported a case in a woman eighteen years old. Mentul (by Wechsler[3]) reported one at seventy-three years. The majority occur during the cancer-bearing age.

Inflammation.—Frank[17] believes that the relation between carcinoma and chronic irritation is more evident in the Fallopian tubes than anywhere else in the genital tract. Orthmann[3] found evidence of salpingitis in 51.7 per cent of cases. A history of sterility or single pregnancies is indicative of a previous pelvic inflammatory disease. Von Franque, Lipschitz, Lady Barrett and Stolz, *et al.*,[17] have reported cases in association with tuberculosis of the tubes. Fränkl[1] does not believe that a previous salpingitis plays a part, since malignancy occurs too infrequently to be associated with pelvic inflammatory disease in a causal relationship. Peham,[1] Vest,[1] Kehrer,[17] Stolz,[1] Wechsler,[3] and Liang[1] do not believe that salpingitis plays any part in the etiology.

PATHOLOGY

The growth usually occurs in the outer two-thirds of the tube. Approximately one-third of the cases are bilateral. At operation a sausage-shaped or club-shaped swelling of the tube is usually present. The fimbriated end is more often closed than not, and the tube and ovary are densely adherent. The picture resembles that of a chronic pelvic infection, with unilateral or bilateral pus tubes. Invasion of the serosal coat of the tube does not occur until late. There may be adhesions to omentum and vesical peritoneum or sigmoid. The tube may be only elongated and thickened, or it may be enlarged to the size of a child's head. The growth, in contradistinction to metastatic carcinoma, rarely penetrates the tubal wall. It fills the lumen and grows towards the abdominal ostium, which closes early—hence the infrequency of carcinomatosis peritonei and ascites—the latter being present in only 5 per cent of all reported cases. The tumour may form a solid, greyish, encephaloid mass, papillary in nature, or it may be cystic, the fluid being watery, hæmorrhagic or even purulent.

Microscopically, three types have been described,—the malignant papilloma, the adenoma, and the alveolar carcinoma, all arising in the mucosa. Liang,[1] Frank,[17] and Robinson[1] believe that fusion of the papillæ, due to pressure, produces the alveoli. Both types have been found in the same tube. The papillary type is most common, fortunately, since the adenomatous type is more prone to penetrate the tubal wall. Squamous-cell carcinoma

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and even pearls have been found in the alveoli. The papillary carcinoma reveals a multilayered polymorphous epithelium upon a thin stroma. As the papillæ become crowded they resemble solid masses. The cells vary in their staining reaction. There is usually a small round cell infiltration in the deeper layers. The ovary may be so involved as to make it impossible to determine the primary site, since papillary tumours of the ovary resemble tubal carcinomata. The adenomatous growth spreading into the uterine cavity may be mistaken, on curettage, for a primary fundal tumour.

Extension and metastases.—The tumour may spread rapidly following rupture after pelvic examination. The growth spreads mainly by the lymphatics to remote locations before it invades the tubal wall. Large masses may be found filling the presacral area, which is reached by the retroperitoneal route. Direct implantations may occur through the abdominal ostium, upon the ovary, peritoneum or mesentery. In these cases ascites may be present. The inguinal nodes may be involved by way of the lymphatics of the round ligaments and may form large tender masses. Although metastases are usually limited to the lower abdomen, they have been found in the liver and even in the lungs. Cullen[18] has reported metastases in stomach, rectum, liver, bladder, skin, supraclavicular lymph nodes, vagina, diaphragm, and uterine mucosa, through implants to the uterine wall by the lymphatics. Hofbauer[17] has reported bilateral cylindrical-cell carcinoma of the tube with squamous-cell carcinoma of the cervix. Kundrat[19] reported tubal carcinoma with metastases in the corpus and cervix uteri.

SIGNS AND SYMPTOMS

It is significant that *the earliest symptoms may be referred to the upper abdomen* and may be *gastro-intestinal* in nature. The commonest complaints, however, are lower abdominal pain associated with a watery or bloody vaginal discharge. The pain comes on early in the disease, in contrast with fundal or cervical carcinoma, and in the early stages is due to tubal colic. Patients have described the pain as being boring, aching, cramp-like, cutting, continuous or intermittent. The flow may be intermittently profuse, as in *hydrops tubæ profluens,* wherein severe pain is associated with distension of the tube by watery or bloody discharge, only to be relieved by the emptying of its contents through the uterine ostium. This symptom-complex was first observed by Latzko[1] and later described in detail by Stanca.[1] The pain may be referred to the bladder, rectum or sacrum, thereby confusing the diagnosis. There may be urinary frequency, incontinence, retention, or dysuria. The ureter may be blocked by metastases to the lymph node located where the ureter crosses the uterine artery. If the uterine ostium of the tube is closed there will be no vaginal discharge. Such a condition existed in our case. Ascites is uncommon, since the fimbriated end is usually closed, and extension to the peritoneum through the tubal wall occurs very late. Examination may reveal merely thickening of the tube, as may occur in salpingitis, or the presence of one or more masses in the adnexal regions, as one might expect to find in the presence of a pus tube. The masses are tender and fixed. If the tube be fixed high in the pelvis by adhesions, then the mass may be mistaken for a cornual fibroid. As a rule, however, it will be found prolapsed in the cul-de-sac. Presacral masses may be felt in late cases. Frequently the inguinal nodes are markedly enlarged. Cachexia develops late.

DIAGNOSIS

The diagnosis is extremely difficult, since there are no symptoms pathognomonic of the condition, and because there is often an association with adnexal disease, fibroids, or ovarian cysts. The only pre-operative diagnosis so far reported was by Dannreuther.[11] The diagnosis has been established, however, by means of a posterior colpotomy. Given a patient complaining of lower abdominal pain, with a thin, watery or sanguineous discharge without uterine changes, with enlarged, irregular, adnexal masses, one should consider carcinoma of the tube as a probable cause of the condition. Malignant degeneration should be suspected in a case of adnexal disease when the mass enlarges and the sedimentation time does not lengthen with rest in bed. Carcinoma of the ovary is less frequently associated with inguinal node metastases, is usually bilateral, and is associated with ascites. Cases have been diagnosed after closure of the abdomen due to failure to open pyosalpinges at operation. X-rays or radium for vaginal bleeding should never be employed without a pathological diag-

nosis. Cases of primary carcinoma of the Fallopian tube have been mistaken for functional bleeding, when a curettage revealed no pathological disturbance in the uterus, and have been allowed to progress beyond hope of alleviation by operation.

TREATMENT

A panhysterectomy and bilateral salpingo-oöphorectomy should be performed and lymph nodes removed whenever possible. Deep x-ray therapy should then be administered in every case after operation.

The prognosis is very poor, since a diagnosis is not made until too late. Primary carcinoma of the tube, particularly the alveolar form, is a very malignant tumour, and only 7 cases have survived three years without recurrence. Haupt's[3] patient lived twenty years. One-quarter of the cases show recurrences in one year. Earlier diagnosis, radical operation, and deep x-ray therapy will probably lessen the poor results and improve the prognosis which has been so unsatisfactory until now.

We were privileged in seeing the following case, which was most probably a primary carcinoma of the left Fallopian tube, and possibly of the right tube as well.

CASE REPORT

Mrs. F.R., aged 65, was treated in the ophthalmological clinic of the Jewish General Hospital in December, 1934, for high myopia and incipient cataract. The relevant family history was interesting, in that her mother had died at the age of 60 from "woman's trouble" associated with vaginal bleeding. A daughter had died from "cancer" of the lung some years previously. The patient's past history was essentially negative. She had given birth to five children, four of whom were living and well. The menses had always occurred regularly and lasted three to four days. The menopause had taken place seventeen years previously, and there had been no bleeding or discharge since. In November, 1937, when again seen at the clinic, she complained of marked dyspnœa and was found to have developed paroxysmal tachycardia.

In February, 1938, the patient was admitted to the medical ward of the Jewish General Hospital, complaining of crampy pains in the abdomen of three months' duration. She described the abdominal pains as being of two types; in addition to a continuous, dull ache which was generalized in nature she experienced crampy and more severe pains in the right lower quadrant and right flank, radiating down the right loin. Some urinary frequency was associated with the onset of these pains; she voided at least every hour during the day and five or six times at night. A catheterized urine specimen revealed the presence of one plus albumin, an occasional blood cell and granular cast. The blood count was within normal limits. The blood Wassermann test was negative. The urologists suggested that a gynæcological examination be performed. The patient, however, refused to stay in the hospital any longer and was discharged the following day.

She presented herself two months later at the medical clinic, this time complaining of rapid loss of weight and continuous crampy pains in the abdomen. A gastro-intestinal x-ray and a barium enema were made, but showed no pathological changes. Five months later, that is, on November 21, 1938, she was again admitted to the ward, where she remained for sixteen days. This time she complained of severe crampy pains in the left lower quadrant and continuous pain in the left hip. The pain was unrelated to the taking of food. During the past eight months she had lost fifteen pounds in weight. Her appetite was fairly good, and her bowels moved daily with the help of a mild cathartic which she had been in the habit of taking. The possibility of a neoplasm in the descending colon was considered, and it was suggested that a laparotomy be performed. The left hip was x-rayed, but no evidence of metastases was found. The patient was again cystoscoped, and this time an obstruction was met with in the left ureter one-half inch from the orifice. The catheter was, however, passed after some manipulation. Fifteen to twenty red blood cells per high power field were found in the specimen from the left ureter. On December 7, 1938, following a stay of sixteen days in the hospital, the patient was discharged against advice, with the additional diagnosis of a possible malignant growth. As yet, a pelvic examination had not been performed.

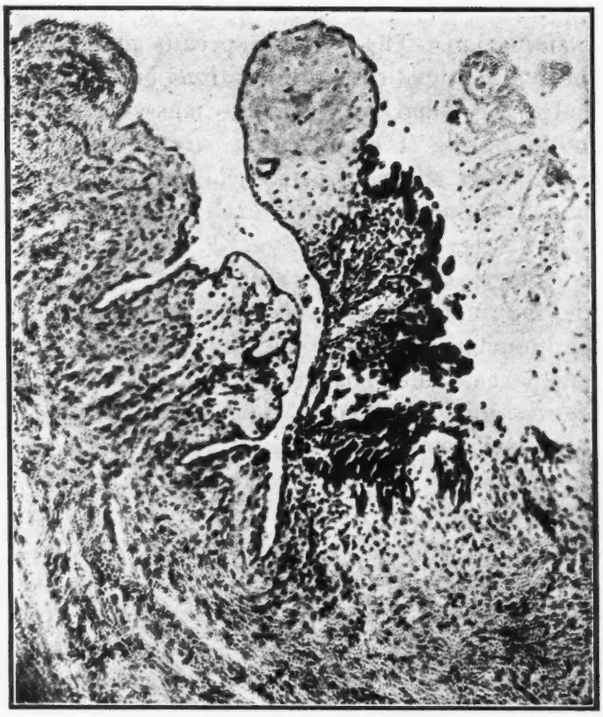

Fig. 1.—Medium power photomicrograph showing a plica in which there is a gradual change from low cuboidal epithelium at the apex to frankly neoplastic and invasive epithelium at the base.

We were first asked to see this patient in January, 1939. She was extremely cachectic. The abdomen was quite tender, and enlarged, hard, discrete, inguinal nodes could be palpated in both groins. In addition, on slipping the fingers over the right inguinal ligament, a firm, fixed and very tender mass, the size of a hen's egg, could be felt in the pelvic basin. The vagina was senile, and admitted only one finger; however, recto-vaginally, the uterus was felt to be normal in size but firmly fixed in the mid-line. In addition, in the region of the left horn of the uterus, projecting into the upper part of the left broad ligament, was a fixed, stony-hard mass, about the size of a small orange. Also, in front of the left sacro-

iliac articulation another and similar mass was felt. Both these masses were extremely tender. On the right side, owing to the tenderness, nothing definite could be made out, merely a vague fullness. A diagnosis of ovarian carcinoma with metastases to the inguinal and retro-peritoneal nodes was made, and the patient referred to the Jewish General Hospital. She was operated upon by Dr. G. J. Strean. The pelvis was found to be "frozen", both adnexæ being bound down by adhesions. On the left side, in the region of the tube, there was a club-shaped swelling of encephaloid material. At the time, this was considered to be an ovarian neoplasm. Following its removal, the patient went into shock, so that the operation had to be terminated at once.

The pathological report was as follows:—

"*Macroscopic.*—The specimen consists of a Fallopian tube and a nodular mass of firm, grey tissue, measuring roughly 6 x 4 x 2.5 cm. This mass is covered on three surfaces by smooth, grey, glistening serous membrane, through which a number of small grey nodules project.

"Upon section, the tissue cuts with gritty resistance. The cut surfaces are grey and granular, with coarse and fine yellow granular streaking.

"The Fallopian tube measures 3 cm. in length. The serosa is grey and smooth. Sections show a patent, distended lumen. The cavity contains grey, grumous material. On the resected edge the tissue cuts with gritty resistance.

"*Microscopic.* — Two sections taken through Fallopian tube show definite thickening of wall and a focal infiltration of the wall by lymphocytes. The great majority of the plicæ are greatly thickened and shortened, and are covered by a single layer of low cuboidal epithelium. In a few of the plicæ, large, polyhedral, foamy cells with small, eccentric, dark-staining nuclei are seen. Several of the plicæ present interesting changes which consist of a transition of the usual low columnar variety to cells which show definite neoplastic changes, with alteration in size, shape and staining qualities, and a definite loss of nuclear polarity and basement membrane. These changes occur in individual plicæ and seem to arise in this situation. Under such plicæ there is definite invasion of the thickened fibromuscular wall by nests of tumour cells which have a tendency to form poorly defined acini. Many of the acini show papillary infoldings. In other situations within the tube necrosis of plicæ is seen, and dark blue concentrically lamellated calcospheres are seen in this situation.

"Section through the large mass, presumably ovary, shows no tissue which can be recognized as ovary. This consists of a mass of fibromuscular tissue, showing extensive interstitial hæmorrhage and foci of necrosis. In some places infiltration by polymorphonuclear leukocytes is seen. Scattered throughout all portions of this tissue, nests of tumour cells are seen. These tumour cells are low columnar in variety, show considerable variation in size, shape and staining quality, and innumerable bizarre, mitotic figures are encountered. In many situations, the tumour has a tendency to form structures resembling plicæ.

"*Diagnosis.* — Moderately differentiated adenocarcinoma, probably arising in the Fallopian tube.

"Following the operation the patient was subjected to a course of deep x-ray therapy. Her course, however, was rapidly downhill, and she died at home three months later (May, 1939). An autopsy was not performed."

COMMENT

In view of the fact that the bulk of the carcinoma was tubal in location, and that the tumour appeared to be located in the wall and plicæ with very little serosal implantation this suggested origin in the tube rather than metastases from ovarian or other primary sites. The gradual transitions of tubal epithelium (see Fig. 1) to a frankly neoplastic type, together with the character of the neoplastic cells and their tendency toward papilla-like differentiation, pointed to a probable origin in the Fallopian tube. Further indirect evidence that this tumour is probably not ovarian in origin is the absence of peritoneal implants and ascites which is frequently associated with ovarian papilliferous adenocarcinoma.

SUMMARY AND CONCLUSIONS

Three hundred and sixty-two* cases of primary carcinoma of the Fallopian tube have been reviewed, and another case added (January, 1939). Only one case was diagnosed before operation. There is no characteristic symptom-complex. Associated conditions, such as fibroids, salpingo-oöphoritis, ovarian cysts, and ascites may accompany the underlying condition and mask it.

It is usually the general practitioner who first sees the patient; hence, the responsibility for excluding the pelvic organs as the site of origin of a neoplasm should be shared by him.

The author wishes to express his thanks to Dr. M. A. Simon for his histopathological description and his photomicrograph.

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NOTE.—To save space these references have been condensed. Practically all of the important ones can be found under the numbers given in the text.—ED.

* Since the above was written, Henderson[20] has reported two cases of primary carcinoma of the Fallopian tube, making a total of 365 reported cases to date.

TRAVELLING CLINICS IN MANITOBA

BY A. L. PAINE, B.A., M.D.

Manitoba Sanatorium, Ninette

THIS paper deals with some of the more practical aspects of travelling tuberculosis clinic work in Manitoba. Broadly speaking, all travelling clinic programs have a common aim. Methods throughout Canada also tend to follow the same basic principle but there is considerable local variation in detail depending on many factors, among them geography, population, and incidence of infection. Thus, in Manitoba we have our particular way of carrying out this work, some features of which may be of general interest.

A large portion of the case-finding work for the province is done by the travelling clinics, but extensive stationary clinic work is also carried out by various institutions in Winnipeg which serve the city and surrounding rural districts.

Travelling clinics began in a small way in 1926 but the program has increased yearly, and in 1939 we made 10,795 examinations, or 2 per cent of the rural population. If we add the number of country people attending city clinics, it is estimated that between 3 and 4 per cent of Manitoba's rural population are now being examined yearly.

Any reference to the development of travelling clinic work must bring to mind the name of the late Dr. D. A. Stewart whose vision conceived the idea in Manitoba and whose energy propelled clinic activities throughout the settled parts, and, to use his own term, into Manitoba's hinterland. Thus travelling clinics were well organized when as yet the only available beds for rural patients were at Ninette. Manitoba Sanatorium continues to be the only centre from which itinerant clinics are conducted. To cover a large province from one centre we use a large outfit travelling long distances, and holding large annual clinics in many places. Without considering merits or shortcomings, it is obvious that such a set of conditions calls for methods and equipment to meet rather unusual demands, and if this point is kept in mind the rationale of many details of our clinic set-up will be more easily appreciated.

The travelling clinics serve the greater part of Manitoba's rural population of 500,000 scattered over a territory of 100,000 square miles, which is the area of the southern half. Practically speaking, this is the inhabited part, the northern half being frequented by a few Indians, Esquimaux, trappers and prospectors. In 1939, besides various school surveys, annual clinics were held in 54 centres. In addition there are 4 centres where clinics are held every month, of which more will be said later. We hold a conference each spring to choose annual centres and set clinic dates. A representative of the Department of Health is present at this meeting, and a central registry is available containing all the known cases of tuberculosis and contacts in the province.

Clinic centres for 1939 have been charted on the accompanying map. It will be noted that

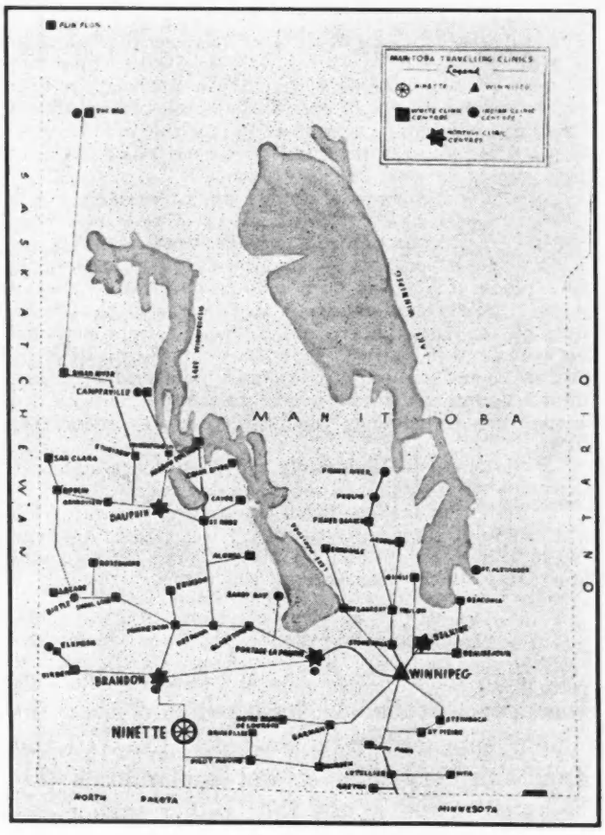

Fig. 1.—Clinic centres for 1939.

the settled areas have been well covered geographically, with some clinics extending to the fringe of civilization. Many clinic centres are permanent; others are subject to change depending on local morbidity and mortality rates. For instance, we have not worked in the south-west part of the province for several years now because of a very low tuberculosis death rate in this district. The closest clinic is 50 miles, the farthest over 500 from headquarters, the average being probably about 150 miles. In a clinic season we travel approximately one mile for every patient examined. Clinics in the same locality are done in groups where possible, thereby saving time and mileage. The large annual clinics run from April to November and the monthly clinics the year round.

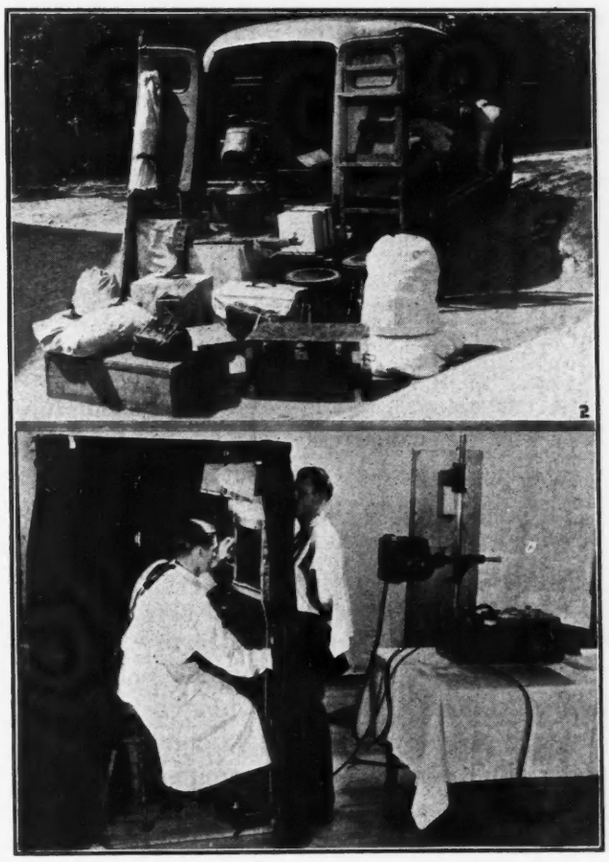

Fig. 2.—The oufit ready for loading.
Fig. 3.—Fluoroscopy; dark room tent showing interior.

Everyone attending must be referred by a local doctor, except old patients and contacts already on our books. The clientèle is made up of the usual groups of contacts, suspects, and old patients. We are also glad to see non-tuberculous chest conditions either for diagnosis or advice or both, and they make up a considerable percentage of the clinic work. All examinations are free, the entire program being financed through the sale of Christmas seals. The cost is estimated at about $2.00 per examination.

The outfit we employ is best described as a truck unit and has been illustrated by photograph. We have two such outfits, but most of the work can be handled by one, the other acting as an auxiliary. The trucks seat five people and carry complete equipment in a large compartment in the rear. The essential parts of the x-ray equipment are a portable x-ray machine, including fluoroscopic unit, a portable Delco engine for generating our own power when necessary, a collapsible dark room tent for plate changing, developing and fluoroscoping, a regular dark room film cabinet, collapsible protection screen and developing tank. Other supplies are also complete, including the usual medical and nursing accessories, examining stools, scales for weighing, and large bags for laundry.

The clinic is usually out for the better part of a week, visiting three to four centres during that time and examining an average of 100 people daily. Thus, with time out for travelling, about 400 to 500 examinations are made weekly. Exposed film is sent back to the Sanatorium daily, when possible, for developing. The outfit comes back over the week-end to re-load, exchange staff, and prepare for the next week's work.

We can work wherever there is room, as we develop our own power when necessary. A set-up requires six separate rooms or compartments, one to act as a combined admitting and waiting room, two as dressing rooms, two as examining rooms and one for x-ray and fluoroscoping. Not infrequently some or all of them must be improvised by sheets strung on ropes. Schools and halls are favourable sites, also local hospitals if room is available, but we have set up in farmers' granaries and Indian log cabins. A locality is prepared for a clinic several weeks ahead of time. Word is sent to the local doctors. Old patients and contacts are notified either by letter or by visits from the public health nurse who consults with the local medical men as well as being guided by the Central Registry. In many localities people commonly travel 50 and occasionally 100 miles to attend a clinic. It is difficult to estimate or control the attendance, so that examination at appointed hours is not feasible. Consequently, clinics are often crowded

and clinic procedure has had to be geared up to a rapid turnover. The usual clinic staff consists of two doctors, two x-ray technicians, and two public health nurses. Clinic hours are commonly from 9 a.m. to 5 p.m. and thereafter until the day's attendance is cleaned up.

The routine clinic procedure is as follows. The people are admitted by the nurse in charge who weighs them and takes down identification data, reasons for examination, and a detailed contact history, if any. This year the routine taking of temperatures has been discontinued because we have found the readings under clinic conditions to be unreliable. Their omission is a great time saver, but they are still taken on obviously ill people. The second nurse supervises the movements of the people through the clinic, sees that they are undressed and properly gowned, and escorts them to the examining rooms and thence to the x-ray room. Our medical examinations have recently undergone some revision, the main change being a more extensive use of the tuberculin test and the dropping of physical examinations in selected cases. With the exception of old patients or those with previous x-ray evidence of infection we now do the tuberculin test on all under 30, providing they can visit their doctor for a reading or seem intelligent enough to make one by themselves. A card already stamped and addressed is given out for this purpose. A brief but complete history is taken on all old patients or others with real symptoms, and these two groups are also given a thorough physical examination. Physical examination is no longer done on contacts without symptoms and on that well-known group of so-called suspects who have no significant symptoms but who have worried the local doctor into sending them to the clinic. More will be said about physical examination later.

Everyone attending the clinic is either x-rayed or fluoroscoped. For the last year we have been making some use of the fluoroscope in selected groups as an alternative to the x-ray. As yet our experience has not been extensive enough to warrant definite conclusions as to its diagnostic accuracy. However, we believe it is a reliable procedure when carefully used on the proper cases, and when backed up by an x-ray when any abnormality is seen on the screen. Its value depends on the care and experience of the operator. The chief difficulty has not been with the procedure itself but in fitting it smoothly into the routine of the clinic. Its use entails collecting a sizeable group of candidates, waiting in the dark room for eye accommodation and shifting the x-ray apparatus, all of which are time-consuming and disrupting to a clinic. However, it saves film and time for the x-ray staff at home and we make use of it when clinic conditions are favourable. The most suitable cases are contacts under 15 without symptoms. Clinical tuberculosis is not often found in this group and chest walls are usually thin so that even small lesions are seldom missed. Another group includes people without any qualifying complaints who manage to get in to the clinic.

A special feature of our clinic work is the developing of x-rays on the road where indicated. When history and physical examination yield a suspicion of disease, or at the request of the local doctor, the x-ray is developed at once. If positive it is shown to the patient and advice given on the spot. This will often bring an unwilling patient in for treatment where a subsequent report alone may fail. Also in outlying districts it saves valuable time in getting the report to the referring physician and thence to the patient.

The dropping of physical examinations, even in selected groups, may be considered by some to be somewhat radical. We took this step after considerable thought and not without support from other quarters. The reasons for doing so are chiefly as follows. With a turn-over of 100 or more a day it is not possible for two physicians to do a thorough physical examination on everyone. Hasty examinations result in careless ways and tend to cheapen a worthwhile procedure. Most chest men will agree that even under ideal conditions not a few minimal lesions and some moderately advanced ones are missed on physical examinations, and under clinic conditions the percentage of errors is greatly increased. As an x-ray or fluoroscopic examination is done on everyone, it seemed a much better use of medical time to reserve physical examination for old patients and people with definite symptoms, and to do the job thoroughly when undertaken. Selective omission also gains time for other valuable procedures such as tuberculin-testing and fluoroscoping. To date we have had no cause to regret this change in procedure.

The trend in Manitoba is towards more monthly clinics. Two such clinics were estab-

lished in 1937, two more were added in 1939, and other centres will no doubt be considered. Obvious advantages are smaller attendance allowing for more careful work and more frequent service to the local doctor and the community. The field for monthly clinics is, however, limited in Manitoba because for adequate attendance these centres need to be in the larger towns surrounded by a fairly dense rural population. For the less populated districts it seems the annual clinic offers the best answer to our own problem at an unusually low cost.

In conclusion, we look upon travelling clinics in Manitoba as an important phase in our anti-tuberculosis campaign. Besides the activities already outlined, travelling clinics are a powerful factor in keeping the public and medical profession tuberculosis-conscious. From the public standpoint a large clinic outfit becomes somewhat of a personality within the province, and, like a circus, is always news when it comes to town. The local doctor occupies a key position in our program. We appreciate the rôle he plays and attempt to maintain it by encouraging his attendance at clinics, emphasizing that we come as consultants to examine his patients, and by sending reports to him and not to those examined. We need his co-operation and support to make our clinics a success, and in return we bring to him a necessary service which has also a definite educational value.

THE CORROSION OF METALS IN TISSUES; AND AN INTRODUCTION TO TANTALUM

BY GERALD L. BURKE, M.D.

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THE use of metals in the repair and reconstruction of various tissues has engaged the interest of surgeons for hundreds of years. The earliest record I have found, in a none too diligent search, is the report of Petronius in 1565 of his use of gold plates to fill the gap in cleft palates. Langenbeck in 1850 was the first to report a technique for the nailing of fractures of the femoral neck. His method fell into disrepute because of the little understood but generally disreputable behaviour of metals in tissues. Lane, in about 1896, began to use steel plates and screws and German silver plates for the internal fixation of fractures. Before long, however, it was found that in a couple of weeks these plates were rejected by the bone, with the accompaniment of much local swelling, pain, tenderness, and discoloured sterile pus. The long and unhappy history of metals in surgery has been a consistent record of necrosis of bone and soft tissues, interference with bone growth and repair, and delayed union, mal-union, and non-union.

Silver, gold, lead, tin, aluminum, copper, iron, steel, nickel, bronze, German silver, and many other metals have been used with the same unsatisfactory and often disastrous results. Only in the last few years with the development of fairly non-irritating alloys has the internal fixation of fractures returned to favour.

The disappointing results were, and still are, due to the electro-chemical phenomena known as corrosion of the metal which introduces soluble and more or less toxic salts into the body fluids.

THE THEORY OF CORROSION

The corrosion of a metal is an oxidation process, that is, a process in which electrons are removed from the atoms of the metal. If corrosion is to occur, an oxidizing agent, a substance eager to remove electrons from the metal, must be present. Such an agent, namely oxygen itself, is circulating in equilibrium with hæmoglobin in living tissue. Oxidizing agents other than oxygen are also present, engaging the long succession of oxidation reactions occurring in metabolism, but the following discussion will be presented as if oxygen were the only oxidizing agent involved, since it is probably the most important one in corrosion processes.

Since metals are conductors of electrons the two steps involved in corrosion, namely, the loss of an electron from an atom of the metal and the acquisition of an electron by the oxidizing agent, need not, and in general will not occur at the same point on the surface of the metal.

Even if the metal involved consists of a single element, for example, pure iron, there will be regions of the surface which differ slightly from one another in structure and in their tendency to acquire a positive charge. Those regions which show the greatest tendency to become positively charged are called anodic regions; at these points on the surface the loss of electrons from atoms of the metal occurs most readily. The regions which show the least tendency to become positively charged are called cathodic regions; at these points of the surface the donation of electrons to the oxidizing agent occurs most readily. The corrosion of a piece of pure iron may then be represented by the following scheme:

Anodic reaction: $2Fe$ (metal) $\longrightarrow 2Fe^{++}$ (ion) $+ 4$ electrons.

Cathodic reaction: $O_2 + 4H^+$ (ion) $+ 4$ electrons $\longrightarrow 2\ H_2O$.

The electrons are transferred from the anodic regions to the cathodic regions by conduction through the metal. The hydrogen ions which engage in the cathodic reactions are supplied by the tissue fluid in which the reaction occurs; the more acid the medium, the more readily the cathodic reaction occurs. If the positive charges formed at the anodic region are confined to the surface of the metal, it becomes increasingly difficult for the oxidizing agent to extract electrons from the metal since electrons are attracted by a positive charge. If, however, the positive ions formed at the anodic region diffuse away into the surrounding tissue corrosion goes on unhindered.

The positive ions liberated into the tissue may react with other substances present in the tissue with more or less harmful results. In the case of iron the oxidation of the metal is carried to the ferric stage; the ferric ions (Fe^{+++}) produced react with water to precipitate hydrated ferric oxide (common iron rust), thus:

$$Fe^{+++} + 3H_2O \longrightarrow \underline{Fe(OH)_3} + 3H^+.$$

The hydrogen ions so produced may then diffuse to the cathodic region to make up the deficiency of hydrogen ions caused by the occurrence of the cathodic reaction. The localization of the anodic and cathodic reactions in different regions of the surface accounts for the pitted appearance in a piece of corroded metal.

Some metals produce ions which form no insoluble products by reaction with the tissue fluid. The corrosion of zinc for instance will introduce soluble and toxic zinc ions into the tissue.

If the metallic object is an alloy of dissimilar metallic elements, or consists of one metal plated with another, the process of corrosion is essentially the same, but is more complicated in some details. The metal component which is more active chemically, *i.e.*, which occupies a higher position in the electromotive series, will more readily become anodic, since great metallic activity is synonymous with small reluctance to form positive ions. This circumstance may lead an alloy or imperfectly plated metallic object to corrode more rapidly than a pure metal. The corrosion of a piece of galvanized iron, which consists of iron covered with a thin layer of zinc, will proceed initially just like the corrosion of pure zinc. As soon as any flaws develop in the coating, however, the exposed iron, which is less active than the zinc, becomes almost exclusively cathodic, and takes upon itself almost the entire labour of supplying electrons to the oxidizing agent. The entire surface of the remaining zinc is now anodic, and the corrosion of the zinc proceeds much more rapidly than would be the case if the zinc were alone. Until most of the zinc is gone, however, the iron corrodes to only a negligible extent. The cathodic reaction is of course the same as before; the anodic reaction may be represented as:

$$Zn \longrightarrow Zn^{++} \text{ (ion)} + 2 \text{ electrons.}$$

The corrosion of zinc in this case is accelerated not only because the whole area of the zinc is anodic but also because the difference between the electrochemical properties of iron and zinc is much greater than that between two regions on the surface of a single metal. This effect exists also in alloys but is less important than in plated objects or in objects made up of pieces of different metals in contact with one another, since the constituents of an alloy are so closely mixed that the development of large areas which are exclusively anodic is unlikely.

THE PROBLEM IN SURGERY

The difficulty confronting the surgeon is that of finding a metal which will not corrode in the tissue, since corrosion may cause necrosis of the tissue not only by liberating toxic metallic ions but also by secondary effects such as the building up of local deviations from the normal hydrogen-ion concentration. The solution of the

problem would be the use of a metal so inert that no oxidizing agent available in the tissues could cause the liberation of any appreciable concentration of soluble compounds. Unfortunately, even quite inert metals may, in the presence of a reasonable concentration of oxygen, form soluble complex compounds which are sufficiently stable so that in time a toxic concentration of these elements can be built up. The only hope of preventing corrosion lies therefore in using a metal which, although it would be corroded considerably if the metal were to reach equilibrium with its surroundings, corrodes at a negligible rate. It should be borne in mind that the rate at which a reaction proceeds and the extent to which it will proceed if given an infinite time are dependent on entirely different factors.

Many metals are able to resist corrosion successfully under mild corroding conditions because of the formation of a thin film of an insoluble compound, usually an oxide, on the surface. If this film is sufficiently compact, continuous, and closely adherent to the surface of the metal it will inhibit corrosion almost completely. The formation of the film prevents metal ions from migrating from the surface of the metal and also prevents the transfer of electrons from the metal to the oxidizing agent. The formation of such films is believed to be the reason for the ability of stainless steels, aluminum, and the familiar chromium trim on automobiles to resist corrosion under mild corroding conditions. If the film is soluble in the medium in which the metal finds itself, however, corrosion will occur.

Immersion in the living tissue is a very severe test of the ability of a metal to resist corrosion, because of the variety of substances which are continuously circulating about the metal and with which the protecting film may form soluble compounds.

The metal which has been most successfully used in surgery thus far is vitallium, an alloy of chromium, cobalt and nickel. This alloy, which was introduced into surgical work by Venable, Stuck and Beach, is quite resistant to corrosion in the tissues. It has, however, several disadvantages: first, even a small amount of corrosion introduces into the tissues soluble and highly toxic chromium salts whose cumulative action over a period of time may be injurious to the patient. It is for this reason that Dr. Stuck has suggested that an effort be made to develop a similar alloy which would offer the same resistance to corrosion and not be too brittle, possibly by using vanadium instead of chromium. Vitallium moreover cannot be machined; every appliance must be cast or ground. For this reason a large supply of various sizes of nails, screws, plates, cups, etc., must be kept on hand. Finally, it cannot be drawn into wire and is expensive.

TANTALUM IN SURGERY

We have been experimenting with tantalum for the past year and a half, and have become convinced that it should be a useful metal for surgical purposes. This little known metal is the 73rd element of the periodic table. It has the advantage of being a single elementary substance and is very resistant to corrosion, probably because of the formation of an extremely thin, transparent, but strong and tenacious oxide film. The oxide is insoluble in almost all acids, but is soluble in concentrated sulphuric and phosphoric acids. The metal is used in chemical industry where great resistance to corrosion and chemical attack is required. Tantalum is inert to salts, dry, wet, or dissolved, except those which hydrolyse to strong alkalies. It is inert to weak alkalies and dilute solutions of strong alkalies. It is completely unaffected by hydrochloric acid, aqua regia, organic acids, salts, alcohols, ketones, aldehydes and esters. It is totally inert to wet or dry chlorine, bromine, or iodine at temperatures below 150° C. The only acids which will attack tantalum are hydrofluoric, sulphuric and phosphoric, the latter two only in concentrated solution at high temperatures. The following table shows its life-expectancy when exposed to the action of the last two acids.

The mechanical properties of tantalum are also impressive. The metal is comparable to steel in its strength, toughness and workability.

Substance	*Time*	*Temperature Deg. C.*	*Percentage loss in weight per month*	*Depth of corrosion cm. per month x 10-5*	*Estimated life based on 50% corrosion loss*
Phosphoric Acid H_3PO_4 Conc.	3 mos.	145	0.014	0.099	870 yrs.
Sulphuric Acid H_2SO_4 Conc.	3 mos.	147	0.013	0.09	955 yrs.

The tensile strength of unannealed tantalum is comparable to that of cold rolled steel; annealed tantalum is as strong as annealed steel. Fine tantalum wire is similar in strength to steel wire of the same gauge. Annealed "dead soft" it can readily be tied in minute strong knots.

Tantalum can be drawn, stamped, and formed into complicated shapes. It may be machined with ordinary steel tools if carbon tetrachloride is used as a cutting compound. The metal can also be hardened by a special process to any degree in the range 150 to 600 Brinell. (The hardness of aluminum bronze is about 200 Brinell, that of chromium-manganese steel about 450).

To summarize its virtues: it is uniquely resistant to corrosion, is as strong as steel, and can be stamped, machined and drawn into wire.

From the foregoing brief and somewhat simplified discussion of corrosion, and from the consideration of the properties of the metal, one would judge that in a nearly neutral system such as the human body there should be no foreign body reaction to tantalum. It should be absolutely inert. This judgment has been borne out in our experience.

Pieces of the metal were kept in Ringer's solution at body temperature for a period of three months. In these elementary tests of corrosion resistance there was no change in the weight or appearance of the metal or in the appearance of the solution. Single tantalum screws and two bone plates were inserted into the fractured and unfractured tibiæ and femora of six dogs and rabbits and removed at periods ranging from three weeks to three months. In each case the screws were held so tightly by the bone that considerable effort was necessary to unscrew them. There was no macroscopic, microscopic, or x-ray evidence of bone or soft tissue irritation. The normal progress of healing was the only reaction detected.

To date, tantalum wire has been used as a skin suture in 34 patients. It has been left *in situ* in several cases for as long as six weeks, and one length of tantalum wire has been used in 5 successive patients. It has proved to be an incomparable skin suture. A few weeks after removal of the suture it is difficult and often impossible to detect where it passed through the skin. These closures are in striking contrast with the customary blobs of scar tissue that line the edges of a wound.

In 11 of these cases tantalum has been used as a subcutaneous suture; in 3 cases as a Bunnell tendon suture; in one case each a fractured patella and a fractured medial condyle of the humerus was wired; and two plates have been used in the internal fixation of fractures. The last two we intend to leave *in situ* for two years before removal. So far we have been unable to unearth the slightest sign of objection on the part of any tissue to the presence of tantalum.

We wish this, however, to be regarded as a preliminary report. We have projects under way on the use of tantalum as arthroplasty cups, as nails for femoral neck and intertrochanteric fractures, as screws to be placed in the jaw and capped by teeth to replace individual missing teeth, and for other dental appliances.

The interest and co-operation of a number of large orthopædic clinics has been secured in the further evaluation of this metal and the detailed consideration of a considerable number and variety of cases will form the basis of a later report.

We should add that tantalum is expensive. At present it costs $60.00 a pound. Appliances supplied to us cost for example: a ¾" screw $1.50; a 3½" bone plate $5.00; a 1½" bone plate $2.75. These of course had to be made to order, one at a time, by hand. If the metal comes into general surgical use the prices would probably be lower. The wire is comparatively inexpensive.

Our deepest thanks are due to Dr. John Norton Wilson, of the Department of Physical Chemistry at the California Institute of Technology, for a great deal of instruction and advice given with sympathetic tolerance. Our gratitude is also due to Dr. David Stevenson and Mr. Emil Burcik of the same institution; and to Dr. C. E. Dolman and Mr. Gordon Matthias of the University of British Columbia.

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THE EFFECT OF OLIVE OIL AND OF COD LIVER OIL ON GASTRIC SECRETION IN THE DOG*

BY OLGA KOMAROV AND S. A. KOMAROV, M.D., PH.D.

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TWO phases in the action of fats on the gastric glands are generally recognized—the first phase, in which fat inhibits, and the second phase, in which it stimulates their activity. The effects of admixture of large quantities of fat (such as 50 or 100 g.) with different test-meals have been studied particularly. In such experiments diminution in the volume, acidity and peptic power of the gastric secretion was observed, as well as prolongation of the time of secretion. The stimulatory phase could be observed in these cases in the late hours of the secretory period (see Babkin[1]). Since the inhibitory effect of a large dose of fat mixed with other food substances may be partially or even entirely compensated by its stimulatory effect, some doubt has always been felt as to whether the use of fat in large doses as a depressant in the treatment of hypersecretory conditions of the gastric glands was justified.

Do small doses of fat produce the same effect on gastric secretion provoked by different food substances as large doses? This problem is undoubtedly of both theoretical and clinical importance. It seemed that it would be specially interesting to study in experimental animals the effect of administering small doses of fat for a considerable period of time, as sometimes practised for therapeutic purposes. A good opportunity to undertake work of this nature presented itself when several of our Pavlov-pouch dogs were operated on in such a way that the secretion was retained quantitatively in the pouch for 24 hours. When the dogs were kept on a standard diet the secretory response of the pouch was remarkably uniform in every way. We were thus able to study not only the immediate 24-hour effect of a small quantity of fat added daily to the regular diet but also the possible cumulative effect of its prolonged administration. Olive oil was selected on the ground of its wide use in gastro-enterological practice. A study of the effects of the daily administration of cod liver oil was of special interest because of its vitamin D content and the possible effect of the latter on blood calcium concentration. It was recently demonstrated (Babkin, Komarov and Komarov[2]) that daily administration of irradiated ergosterol, which produced a moderate rise in blood calcium, caused long-lasting inhibition of the gastric secretion in response to various test-meals. This inhibition was especially pronounced in the nervous phase of gastric secretion.

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METHODS

Three dogs with well innervated Pavlov pouches were used for the experiments. One of the dogs also had a metal fistula in the stomach. 10-D cod liver oil of Ayerst, McKenna & Harrison, having a high content of vitamin D, was employed.

Two types of experiments were carried out. In the first we administered to one of our dogs a single small dose of olive oil or cod liver oil (1 c.c. per kg. of body-weight, total 15 c.c.) through the gastric fistula into the main part of the stomach and studied its effect on the gastric secretion of the pouch in response to a test-meal given 15 minutes later. In control experiments the same quantity of water was substituted for oil. In the second type of experiment, performed on the two other dogs, olive oil or cod liver oil was added daily to the regular diet for a period of one or two weeks, and the 24-hour secretion from the Pavlov pouch was studied during the whole period of experimentation. Two series of experiments of this type were carried out on one dog and one series on the other.

RESULTS

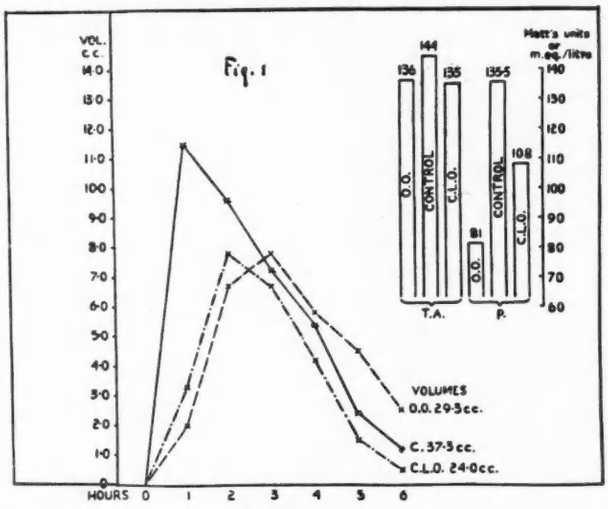
Effect of a single administration of fat.—The results of three typical experiments are shown in Fig. 1. The total volume of secretion was considerably less after olive oil or cod liver oil. This was due to marked inhibition of the secretion in both cases during the first 2½ hours following the ingestion of meat. In the later course of the secretion there was no significant difference in the rate of secretion, the rate in the experiment with olive oil being slightly higher and in the experiment with cod liver oil slightly lower than in the control experiment. The total output of acid was definitely less after olive oil or cod liver oil than in the control. The acid output was 5.4 m.eq. in the control, 3.98 m.eq. after olive oil and 3.26 m.eq. after cod liver oil. The pepsin output was 5,056 Mett units in the control, 2,370 units after olive oil, and 2,750 units after cod liver oil. The lowering of the total output of acid was largely due to

the diminution in the volume of secretion during the first 2 hours, and was further accentuated by a considerable diminution in the concentration of acid during that period. The total acidity of the first sample after olive oil was especially low, *viz.*, 70 m.eq./l., as compared with 140 m.eq./l. in the control and 110 m.eq./l. after cod liver oil. The inhibitory effects of olive oil and cod liver oil on the peptic power of the gastric juice during the first 2 hours of secretion were identical. The peptic power was only 56 per cent of that of the control in the 1st hour, and 60 per cent in the 2nd hour. From the 3rd to the 6th hour, however, there was a marked difference in the effects of olive oil and cod liver oil. In the experiment with olive oil the peptic power continued to be considerably lower than in the control experiment (being from 71 to 85 per cent of that of the control), while in the experiment with cod liver oil the peptic power rose steadily towards the end of the experiment, being in the 3rd, 4th and 5th hours respectively 106, 135 and 150 per cent of the corresponding control values.

These experiments showed that after the administration of a single small dose of olive oil or cod liver oil there was a marked diminution in the volume of secretion in response to a test-meal of meat, as well as a lowering of the output of acid and of pepsin. No second, stimulatory phase of fat action was observed in either case. Nor was the time of complete evacuation of the stomach appreciably affected. No great difference between the effects of olive oil and cod liver oil on the volume and acidity of the gastric secretion was noted. However, in the second half of the experiment with cod liver oil the peptic power gradually rose, while in the experiment with olive oil it remained low.

Effect of prolonged daily administration of olive oil and cod liver oil on gastric secretion.—Three series of experiments, each lasting several weeks, were performed on two Pavlov-pouch dogs, operated on in such a way that the pouch was able to retain the secretion quantitatively for many hours. At definite intervals the secretion was withdrawn from the pouch by means of a small catheter and a syringe. The animals were kept on a standard diet. The results obtained in these experiments were practically identical. Therefore only one series of experiments on Pavlov-pouch dog B will be reported here.

This series consisted of 5 periods, each of 2 weeks' duration, *viz.*, 3 control periods when the dog was on a standard diet, and two intervening periods—one during which olive oil was added daily to the diet, and one during which cod liver oil was given daily. The standard diet for dog B consisted of two meals daily. The first meal, 80 g. of white bread and 250 c.c. of whole milk, was given at about 9.30 a.m.; the second meal, 300 g. of minced lean beef-heart,



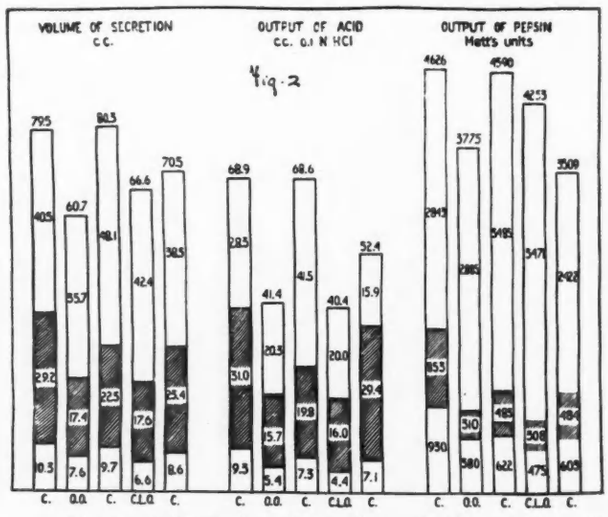


Fig. 1.—Effect of a single dose of olive oil or cod liver oil on gastric secretion.

Control experiment, "C."; experiments with olive oil and cod liver oil, "O.O." and "C.L.O." respectively. The gastric juice was collected hourly for 6 hours. In all cases the stomach was found to be empty at the end of the experiment. The columns in the upper right-hand corner represent the average values for total acidity (T.A.) and pepsin concentration (P.) for the total 6-hour secretion.

Fig. 2.—Effect of daily administration of olive oil or cod liver oil on the 24-hour secretion of a Pavlov pouch.

Control, "C."; olive oil, "O.O."; cod liver oil, "C.L.O." The lowest section of each column represents sample I (secretion during the first 3 hours); the shaded area, sample II (secretion during the following 5 hours); the top section, sample III (secretion during the remaining 16 hours).

10 g. of dry brewer's yeast and 2 g. of table salt, together with all the pouch secretion of the previous day, was given 3 hours after the first meal. Fifteen c.c. of olive oil were given daily with the first meal for 2 weeks between the 1st and 2nd control periods, and 15 c.c. of cod liver oil were given daily for 2 weeks between the 2nd and 3rd control periods. Three samples of secretion from the pouch were collected daily: sample I represented the 3 hours' secretion following the first meal, sample II the 5 hours' secretion following the second meal, and sample III the remaining 16 hours' secretion.

The results of this series of experiments are presented in Fig. 2. Each value, represented in the form of a column, is the average of 8 experiments. In the experiments with olive oil the volume of secretion in each period was uniformly diminished (by about 25 per cent) as compared with the control. Diminution in the volume of secretion was also quite marked in the experiments with cod liver oil, but it was not so uniform as with olive oil. The greatest inhibition occurred during the first, 3-hour period of digestion; the least inhibition was seen in the last, 16-hour period. The total inhibitory effect of cod liver oil on the volume of the gastric secretion was less than that of olive oil. The acidity in sample II was not changed either after olive oil or after cod liver oil, as compared with the control, but in the other two samples it was considerably lower. Therefore both with olive oil and with cod liver oil the output of acid was decreased to a greater extent than the volume of the secretion. The peptic power of the gastric juice was not changed materially in either case. A clearer picture of the activity of the peptic cells can be obtained by considering the output of pepsin. The output of pepsin in the experiments both with olive oil and with cod liver oil was decreased mainly during the second, 5-hour period of digestion, and much more markedly after olive oil than after cod liver oil. Therefore it is evident from these experiments that the activity of the parietal cells was inhibited to the same extent by both oils, while the function of the peptic cells was not as greatly depressed as that of the parietal cells, especially in the case of cod liver oil.

Our experimental data suggest that, if small quantities of olive oil are added to the regular diet, there is scarcely any cumulative effect on gastric secretion. The inhibitory action of olive oil described above develops on the first day and disappears rapidly when the oil is withdrawn. In the case of cod liver oil there are definite signs that some sort of cumulative effect takes place. The inhibitory action of cod liver oil increases progressively for several days. Moreover, when cod liver oil is withdrawn, the secretory activity of the gastric glands does not return to normal for some days. This is illustrated by the data for the last control period (see Fig. 2); the volume of secretion and the outputs of acid and pepsin did not return to the previous control values.

The results of all three series of experiments with daily administration of olive oil and cod liver oil are summarized in Table I, which illustrates the most important result of this investigation, namely, that small quantities of olive oil or cod liver oil added daily to a standard diet definitely diminish the gastric secretion, both during the most active period of digestion and during the later hours of the secretion.

TABLE I.

EFFECT ON GASTRIC SECRETION OF THE DAILY ADDITION OF OLIVE OIL OR COD LIVER OIL TO A STANDARD DIET

	Olive Oil			*Cod Liver Oil*		
		Output of			*Output of*	
Sample	*Volume*	*Acid*	*Pepsin*	*Volume*	*Acid*	*Pepsin*
I (3 hours)	−14	−19	− 9	−25.4	−32	+2
II (5 hours)	−14	−10	−14	−18.5	−28	−14
III (16 hours)	− 7.1	−12	−13	− 5.5	− 1	− 5
Total (24 hours)	−12	−16.4	−18	−13	−17	− 5

The mean values for the volume of secretion and for the outputs of acid and pepsin were calculated from the results of 24 experiments carried out on two dogs, for each of the three periods of observation, *viz.*, (1) first 3 hours of digestion (sample I), (2) 4th to 8th hours inclusive (sample II), (3) remaining 16 hours (sample III). The control averages were calculated from the values of the second control interval only, that is, the one which was interposed in each series between the experiments with olive oil and those with cod liver oil. The differences between the control values and the corresponding values for the experiments with olive oil and with cod liver oil were calculated as percentages of the control values. The minus sign denotes inhibition of the activity of the gastric glands caused by the oil, the plus sign, an increase in their activity.

DISCUSSION

The doses of oil used in our experiments were less than 1 g. per kg. of body-weight. The

addition of fat to the diet in such amounts does not make it unbalanced.

Olive oil, when introduced into the stomach in such quantities, inhibited gastric secretion in response to a single test-meal of lean meat given subsequently. The volume of secretion and the outputs of acid and pepsin were markedly lower than in the control experiments. This was largely due to the depression of the nervous phase of the secretion. In this respect our observations are in accordance with the results of Alley, MacKenzie and Webster,[3] who stated that uniform inhibition of all the secretory activities of the gastric mucosa occurs during the first stage of the action of fat, especially if the effect of the secretory stimulus follows closely upon the introduction of the fat, or when a large amount of fat is given. Similarly, we have seen that when olive oil was added regularly to a standard diet over a period of one or two weeks there was a definite inhibition of gastric secretion. The 24-hour volume of gastric secretion and the total output of acid and of pepsin from the Pavlov pouch were almost uniformly diminished to about 85 per cent of the control values. It is important that at no time was any material increase in the acidity observed. These experiments, therefore, indicate that in the case of olive oil the inhibitory effect of the neutral fat exceeds the excitatory effect of the products of fat hydrolysis. The practical conclusion to be drawn from these experiments is that in proper quantities olive oil, and most probably other neutral fats, can be used to advantage when it is desired to inhibit gastric secretion or to increase the caloric value of the diet without imposing any additional strain on the gastric glands.

In regard to our experiments with cod liver oil it must be borne in mind that the particular preparation of cod liver oil used in this work was especially rich in vitamins, containing 2,000 international units of vitamin A and 400 units of vitamin D per gram. In many respects the action of this preparation of cod liver oil on gastric secretion was similar to that of olive oil. Cod liver oil introduced into the stomach before a standard test-meal of meat caused a marked inhibition of the secretory function of the gastric glands during the first 2 or 3 hours of digestion —that is to say, the volume of gastric secretion from the pouch and the output and concentration of acid and of pepsin were considerably lower than in the control experiments. Similarly the immediate inhibitory effect of cod liver oil on the volume of secretion and also on the output and concentration of acid was quite pronounced in the experiments where cod liver oil was added daily to the standard diet. Moreover the inhibitory effect of cod liver oil on the volume and the acidity of the secretion during the first 3 or even 8 hours of digestion was manifestly higher than that of olive oil. In this respect our observations are in agreement with the data of Roberts,[4] who found that in man cod liver oil inhibits the secretion of acid by the stomach to a greater extent than does olive oil. Roberts ascribed the greater potency of cod liver oil as a depressant of gastric secretion to the lesser degree of saturation of the component fatty acids. There are no data on the volume of secretion or its peptic power in Roberts' article.

We found that in the late hours of digestion the inhibitory effect of cod liver oil on gastric secretion was less pronounced than that of olive oil. In some experiments with cod liver oil, there was even a slight increase in the secretory activity as compared with the control experiments. Olive oil given before a single test-meal of meat, or given daily to a dog on a standard diet, always inhibited the activity of the peptic cells. It was not so with cod liver oil; after an initial sharp decrease the peptic power of the juice gradually rose during the late hours of the digestive period. Consequently, the total output of pepsin for 24 hours after ingestion of cod liver oil was diminished on the average by only 5 per cent as compared with the control, whereas olive oil depressed the output of pepsin by 15 per cent. Therefore it appears that after administration of cod liver oil some substance is absorbed which stimulates the parietal cells slightly and the peptic cells considerably, especially during the late hours of digestion. Vitamin D cannot be considered responsible for this effect, since irradiated ergosterol has been shown to inhibit the activity both of the parietal cells and of the peptic cells.[2] Whether vitamin A or some unknown ingredient of cod liver oil is responsible for this particular action of cod liver oil is a matter for further research. However, from the practical point of view it is important that, when cod liver oil is used in quantities of about 1 g. per kg. of body-weight, the inhibitory action on gastric secretion

predominates just as in the case of olive oil. Therefore from these experiments it may be concluded that cod liver oil can safely be prescribed not only in order to increase the intake of vitamins A and D, when it is desired not to aggravate an existing hyperactivity of the gastric glands, but even for the purpose of actually inhibiting gastric secretion.

SUMMARY

A single small dose of olive oil or cod liver oil (about 1 c.c. per kg. of body-weight), introduced a short time before a test-meal of meat into the stomach of a dog with a Pavlov pouch, reduced the volume, acidity and pepsin content of the gastric juice secreted by the pouch. This inhibition of gastric secretion was especially marked during the first 2 or 3 hours *post cibum*. There was no appreciable effect on the time of evacuation, and no increase of the gastric secretion in the late hours of the experiment, except after cod liver oil, when the peptic activity was somewhat increased during the 5th and 6th hours of secretion.

The daily addition of a similar small dose of olive oil or cod liver oil to a standard diet for one or two weeks likewise depressed the secretory activity of the Pavlov pouch, especially the secretion of acid. Olive oil inhibited gastric secretion more or less uniformly throughout the 24-hour period of observation, whereas after cod liver oil a stimulatory effect on the peptic cells was observed during the later hours of digestion. There is some evidence that cod liver oil administered daily exerts a cumulative effect on the activity of the gastric glands.

We gratefully acknowledge the many helpful suggestions which we have received from Professor B. P. Babkin during the course of this work.

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PROGRESSIVE POST-OPERATIVE GANGRENE OF THE SKIN

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BY Canadians, anything we read in the *British Journal of Surgery* is accepted. It was interesting to read there in the spring of 1935 an article by A. M. Stewart-Wallace on a condition called progressive post-operative gangrene of the skin. Dr. Robert Hutchison and associates, not having seen a similar condition, were unable to control the spread of the infection and gangrene for eight months in this case. A search of the literature at this time revealed 37 cases up to 1934.

This is, then, a rare condition of typical appearance and characteristic progress, appearing in the first two weeks after operation, mostly for appendiceal abscess, perforated duodenal ulcer, or thoracic empyema, and affecting only the thickness of the skin. H. J. Vier, in describing a recent case, states that the condition is so rare that it is not observed more than once or twice in the experience of the average surgeon, but when it does occur it is so devastating to the patient and distressing to the surgeon, that one is impressed by the importance of its early diagnosis and proper treatment. This then is our excuse, that this brief synopsis may be of use to some one, some place, some time.

The infection starts as a soreness, burning, redness and œdema adjacent to the operative wound, almost always in one or more of the stitch holes, the infection not subsiding with removal of the suture. The swelling becomes bluish and takes on the appearance of a carbuncle. In the second or third week the skin sloughs separate, leaving the base covered with red granulation tissue, which in places show a tendency to heal with the appearance of islands of epithelium, probably arising from cells in sweat glands or hair follicles. Around the granulating area is an irregular spreading gangrenous edge, which gives rise to the typical appearance of the lesion. This may be divided into four zones: (1) an outer zone of tender induration and congestion, about one inch wide, fading into healthy uninvolved skin; (2) a zone of black or purplish gangrenous skin, half an inch wide, with sharply demarcated edges; (3) a slough, originally white, becoming a dirty green; (4) healthy red granulating tissue where

the slough has separated. In no case were the muscles or deeper tissues affected, and, similarly, no history of post-operative herniation was obtained.

Fifty per cent of the cases occurred in patients past forty-five years of age. A marked feature was the exquisite tenderness with a severe burning sensation in the active edges of the lesion. The temperature ranged from 99 to 101°. The patients seemed to suffer from exhaustion from pain and loss of sleep rather than toxæmia. This perhaps explains the noticeable personality change that is associated with this condition, as the patients become morose, unco-operative, and depressed.

Pathologically, the condition appears to be due to an association between an anaerobic streptococcus and a hæmolytic staphylococcus. There is no thrombosis of the blood vessels, which are dilated, with a large number of polymorphonuclear cells clinging to the walls. This suggests that the gangrene is due to some lytic substance in the tissues rather than a cutting off of the blood supply, as in a carbuncle. There appears to be no limit to the extent of the ulceration if successful treatment is not employed; Robert Hutchison's case is reported as having the eventual ulcer area reaching from the occiput to the crest of the ilium, and involving the whole anterior wall surface.

At the present time there appears to be only one successful manner of treating this condition.

1. Bearing in mind that the infection is present in the outer erythematous zone, it is necessary to excise wide of the advancing gangrenous edge of the skin, and this is the essential principle. In trying unsuccessfully to save skin, second and third excision operations have been necessary.

2. The resultant ulcer area is treated best by the procedure of Dr. Frank Meleney, of New York City, using a zinc peroxide cream. Only one brand of zinc peroxide, that made by the Du Pont Chemical Company, of Niagara Falls, N.Y., has been found active, according to Dr. Meleney in a report in the *Annals of Surgery* for June, 1939. The ZPO powder is sterilized in small quantities of from 5 to 20 g. at 140° C. for four hours. This heating not only sterilizes the ZPO, but in some way mobilizes the oxygen. The dry powder is then suspended in equal parts of sterile distilled water, forming a 40 per cent cream. This cream is applied to every part of the wound surface. A double layer of fine-mesh gauze is soaked in the suspension of the ZPO and placed over the ulcerated area, and this in turn is covered with gauze compresses of sterile distilled water. The whole dressing should be sealed with several layers of vaseline gauze, to prevent evaporation. In twenty-four hours the dressings are removed, the wound irrigated with warm saline to remove exudate and old ZPO, and a similar fresh set of dressings applied over fresh ZPO cream. In fourteen days, the whole area may be expected to be covered with healthy granulations and new skin growing in from the edges. Skin grafting may now be considered. It is important to note that any attempt at approximation of the skin edges with adhesive is a mistake, as this tends to cause infective pockets which may cause the condition to flare up.

ZPO may be tested easily for effectiveness as follows. Five g. are added to 50 c.c. of distilled water and allowed to settle at room temperature. The sediment should form quickly as a flocculent curd; the supernatant fluid should be clear. Within an hour bubbles of gas should form in the sediment and lift it up.

3. Although one does not find mention of the sulphanilamides in the treatment of this condition, we all have a kindly feeling towards this very excellent group of drugs, and it is hoped that its newer member, sulphamethylthiazol, which is still in its experimental stage, may be of service in this condition, where its action on both streptococci and staphylococci could find full scope.

CASE REPORT

(Calgary Gen. Hosp., 1937/5422). The patient was a surgeon, aged 55, who gave a history of having had when a child of five, a serious illness thought since to be due to a ruptured appendix. After a long convalescence he recovered without operation. He had no further attacks during the intervening years until three weeks before consultation, when for two days he had had some discomfort in the right lower abdomen. This discomfort, although much easier, had to some extent persisted, and two days before admission, became quite acute with marked colicky pain and vomiting.

On December 4, 1937, the patient was admitted to hospital. With spinal anæsthesia, the abdomen was opened, an appendiceal abscess, with a long fæcolith lying loose in abscess cavity, and an extensive corresponding perforation in the appendix were found. The appendix was removed, drainage instituted and the abdomen closed. A swab from the abdominal discharge at this time demonstrated a mixed streptococcus and *B. coli* growth.

The usual treatment of Fowler bed, hot fomentations to the abdomen, glucose saline intravenous injections, and neo-prontosil, 5 c.c. intramuscularly b.i.d, was instituted.

The patient made an uneventful convalescence for seven days, when it was noted that he was having more pain in his abdomen, and, on examination, some redness and swelling were present to the right of the upper end of the incision and a drop of pus was noticed discharging from around the upper suture hole. The suture was removed and a small drainage tube was inserted under the skin in this region. A heat lamp was applied daily for ten minutes.

On December 18th, two weeks after operation, the hospital record notes showed that the condition to the right of the upper end of the incision had not improved, redness and swelling, with, later, a carbuncle-like formation developing. The centre of this swelling was necrosed and several discharging points were present. The patient complained of a constant burning sensation in this region. Incision of the slough did not improve drainage. Sulphanilamide, gr. xv, q.i.d., was ineffective.

December 29, 1937. The condition had now become an ulcer with irregular edges, with a portion of slough remaining and granulating tissue being present where the slough had separated. During the previous two days it had been noticed that the patient complained of continual burning in the edges of the ulcer and the ulcer appeared to be enlarging. A diagnosis of progressive post-operative gangrene of the skin was made, and under gas anæsthesia, with the electric knife the skin edges were excised wide of the reddened area. Cultures demonstrated staphylococci, streptococci and *B. coli*.

January 5, 1938. Since excision of the skin edges, the patient has been comfortable. The constant burning disappeared immediately afterwards.

January 9, 1938. The patient appeared to be doing well until the day before, when along the operative scar at the edge of the ulcer an area became dark and slightly swollen. Fearing that this might be a flare-up of the previous condition, wide excision was done. It was at this time that, through the courtesy of the Du Pont Chemical Company, we were able to procure a supply of ZPO, and following out Dr. Meleney's procedure had no further difficulty. Three weeks later, the patient was readmitted to hospital for skin-grafting. His wound was entirely healed by April, 1938.

GENETICAL RESEARCH IN MEDICAL PRACTICE

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THE importance of a careful consideration of family histories has been appreciated more by the country practitioner than by anyone else. By a very natural process he has become a practical geneticist, often without himself realizing it. Knowledge of the members of his community comes to him from non-professional contacts which the city physician usually does not have with his patients. The knowledge of human inheritance gained by a consideration of many carefully recorded family histories is the foundation for medical genetics. Alert physicians today are placing more emphasis upon the hereditary factor in the etiology of disease.

Macklin[1] has pointed out that medical genetics offers clinical aid to other branches of medicine in the diagnosis, treatment, and prevention of disease. Emerson[2] suggests that family pedigrees be made "an integral part of medical records".

The present paper provides the physician with an outline of the information which a complete family history should contain. From the analysis of family histories of this sort the medical geneticist will derive practical knowledge of great value to the clinician. The specialized training of the clinician does not prepare him for the statistical work required in the analysis of such records. Nevertheless, the opportunity for collecting such records is open only to the clinician, and he may depend on the co-operation of the geneticist and the statistician to perform the less esteemed labour of statistical analysis.

The General Practitioner

Clouston[3] refers to general practice as "a specialty of its own". The general practitioner draws upon the knowledge of all the specialties. Today he is taking heed of the advances in medical genetics, so that his work as a practical geneticist is becoming more critical and proligerous. Troublesome hereditary conditions which occur in both city and country practice are still more frequently recognized in the country, where the physician usually knows the members of several generations of the family from personal contacts. Investigation of such conditions is one important type of research which the general practitioner is specially qualified to prosecute.

It is not generally recognized that the collection of facts about patients constitutes a form of research. The limitless value of careful records is not sufficiently stressed. The immediate reward to the physician for this type of research is a better understanding of the condition of the patients in the affected family. The ultimate reward is the discovery of the

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practical clinical measures for prevention and therapeusis. These are revealed as a consequence of the analysis of large numbers of family histories of the same condition. The general practitioner is urged to record his family histories in the manner illustrated below, rather than to attempt the collection of long pedigrees. Many such family histories are required for a single analysis, and for a given condition a sufficient number may not occur in the practice of any one man. Consequently all physicians are urged to put their histories on record (without waiting until they have one or two thousand cases) in the belief that their series will complement the series of others doing this research.

MEDICAL SPECIALTIES

Paul D. White[4] states that a carefully taken history is of more importance in diagnosing cardiac conditions "than all the other methods of study (physical examination, electrocardiography, roentgenology, and other laboratory aids) put together, although there are occasional exceptions". He would assign a value of at least 50 per cent to the general history (which includes family history, personal history, history of the present illness). As medical men familiarize themselves more with the applications of genetics to medicine they put more emphasis upon the value of the family history to guide them in the diagnosis, treatment, and prevention of disease.

However, it is at the time when the clinical specialist undertakes the study of the etiology of a particular disease that the question of heredity really confronts him. The thoughtful and well-read clinician will then have on hand, or try to procure, for analysis a large series of complete and reliable family histories. Only in such a way can he ultimately arrive at a proper evaluation of the importance of the hereditary factor which enters into every pathological condition to some degree.

The obstetrician is sometimes faced with the problem of deciding for parents the advisability of another pregnancy after the birth of a deformed infant or a monster. Here is another circumstance which illustrates how the other specialties in medicine can help themselves by collecting apposite information for analysis by the medical geneticist. Accurate descriptions (external, enlarged upon by the protocol of an autopsy) of congenital malformations, accompanied by complete, detailed, reliable family histories, will one day be accumulated in sufficient number to give a significant, trustworthy answer to this troublesome question raised by the parents. It is within the powers of the obstetrician to contribute to the solution of this problem by following the method of history-taking herein reported in all cases of congenital deformity.

The establishment of a national Twin Registry for monozygotic twins would be a further help in the study of human genetics. Responsibility for the registration of newborn twins would rest with the obstetrician. At the birth of the twins certain important data (evidence of monozygosity) would be sent to the Registry, to be enlarged upon at intervals during the childhood and adolescence of the subjects. Physicians who see such subjects frequently over a period of years, who have the confidence of their patients, and who have office facilities for making objective measurements such as are needed, are the persons qualified to do this research.

MEDICAL EDUCATION

A true understanding of the importance of the hereditary factor in disease cannot be expected of our medical school graduates until the schools provide instruction in medical genetics. Ohio State University medical students already enjoy the advantage of such instruction. The limitations of the old studbook (or simple pedigree) method of recording hereditary traits are not understood by many physicians. Hogben[5] emphasizes that persons with a condition dependent on recessive genes are usually the offspring of parents who do not show the trait. In fact such persons may have no near relatives who show the trait. The collection of a pedigree of three or four generations of one family is then of no avail. But statistical methods, based upon a sufficient number of accurate, detailed family histories, as illustrated here, are then still applicable and become invaluable.

AN ILLUSTRATIVE FAMILY HISTORY

The following outline is offered as an illustration of the information required by the medical geneticist for his analysis. An attempt has been made to omit all unessential detail. Emphasis should be placed upon the informa-

ILLUSTRATIVE HISTORY

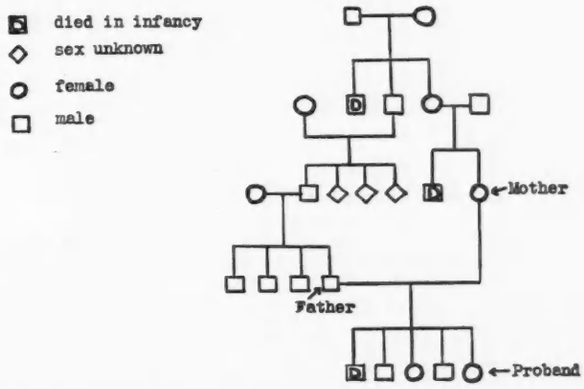
I. *Proband** — DATE OF HISTORY, JUNE 8, 1936

A. Sex, ♀.
B. Present age, 23; date of birth, May 5, 1913.
C. Diagnosis, hayfever (ragweed); treated by examiner.
D. Age at onset, 9 (Sept., 1932: late return to school in 4th grade).
E. Marriage, widow; no children.
F. Relation of partner. No relationship known, but families have lived in same district for at least four generations.
G. Date and cause of death: (living)

II. *Sibs*

Sex	*Date of birth*	*Diagnosis and comments*†
♂	1901	Died in infancy (hypertrophic pyloric stenosis; hospital record).
♂	1904	Living and well, (32) seen by examiner; no clinical allergy (*cf.* note giving criteria used). Married, three children.
♀	1907	Living and well, (29) seen by examiner; no clinical allergy. Unmarried.
♂	1909	Living and well, (27) seen by examiner; hay fever (ragweed) and asthma; onset 1920 (11) verified by sibs independently. Married five years, no children.
♀	1913	(proband, *cf.* above)

III. *Parents*	*Father*	*Mother*
A. Age (or age at death)	58	54
B. Date of birth	Jan. 1, 1878; no birth certificate.	Nov. 13, 1881, church record.
C. Diagnosis	Asthma (horse); treated by examiner.	Eczema (unknown).
D. Onset	38 (began work with cavalry regiment).	Occasionally since weaning; outbreak never seen by examiner.
E. Date and cause of death	(Living).	(Living).
F. Consanguinity: *cf.* diagram.		



G. Sibs	3 brothers living and well; no allergy (not seen by examiner—testimony of the proband's father); ages 50, 53, 54.	None living; brother died in infancy (hypertrophic pyloric stenosis; hospital record).

IV. *Grandparents*	*Paternal*		*Maternal*	
	Father	*Mother*	*Father*	*Mother*
A. Age (or age at death)	61 (dead)	26 (dead)	93 (alive)	60 (dead)
B. Date of birth	Not asked.	Not asked.	Not asked.	Not asked.
C. Diagnosis	No allergy (son's testimony).	Hay fever in late summer.	No allergy (patient's testimony).	No allergy (husband's testimony).
D. Onset	None.	Unknown.	None.	None.
E. Date and cause of death	1898 (strangulated hernia (hospital record).	Jan., 1878, childbirth (birth of last son).	(Living)	Not asked.
F. Consanguinity	None.	None.	None.	None.
G. Sibs	3 younger; age and sex not asked about; no allergy.	No sibs.	Not inquired about.	Older of two brothers died in infancy, cause unknown.

*The patient whose condition brings the family to the examiner's attention.
†Give cause and age at death for dead sibs. Record identical twins or other multiple births among sibs, marriages and number of offspring.

tion concerning the children and the parents. In certain conditions it is necessary, however, to know something further about the grandparents. A knowledge of the laws of heredity is not a prerequisite for gathering useful family histories. For any condition reported the criteria used clinically for diagnosis should be recorded, *at the time* (for these may change in the course of one examiner's experience).

COMPLETENESS

Every experienced worker will recognize the importance of making an entry after every heading in the outline *at the time of the interview*. Something should appear, even if it be the words "not inquired about"—which may draw the physician's attention to the item at a later examination. It is discouraging to return to a supposedly complete and reliable report after several years have elapsed, to find gaps in the record. It is then impossible to decide whether the information was lacking or whether it was not relevant. In the data of Cooke and Vander Veer[6] on allergy the heading "maternal family history" is sometimes filled in "negative" and sometimes left blank. Consequently one cannot decide whether the history was negative or lacking. Every heading is important and should be filled in.

THE AGE OF ONSET

"There is little doubt of an hereditary predisposing factor which will determine age of onset . . . in . . . forms of allergy", writes Vaughan.[7] Studies of twins[8] substantiate this idea that the age of onset of a disease may itself be inherited. Nevertheless, the final proof rests with the physicians now practising medicine. They have the opportunity for collecting family histories of the detailed type indicated above which can decide the question for every disease studied. The age of onset should be given for each affected person. Cooke and Vander Veer[6] and Spain and Cooke[9] recorded the age of onset for the proband only. Consequently it is not possible to use their data for a study of the inheritance of the age of onset.

The age of onset is important for another reason. The medical geneticist will use it as a criterion for separating unaffected from potentially affected members of the family.

It is not always possible to determine the age of onset precisely, but the closest possible approximation should be made. It should be accompanied by a statement of the criteria used and an estimate of their accuracy. If the patient's response varies at subsequent interviews —if the range of his replies is three years (the age of onset is no more accurate than that) the notes should indicate the variation. Likewise when the age of onset given by the proband is corroborated by his relatives independently, the item will have greater value when that indication of its reliability is noted.

RELIABILITY

The practice of obtaining the same information from several sources is to be recommended. Wiener *et al.*[10] made a study on the inheritance of allergic disease, based upon family histories collected in the most reliable way possible at the time. Their patients were children at the Jewish Hospital in Brooklyn. The parents were questioned separately so that two independent histories were obtained. Uncertain points were cleared up by presenting the parents with written questions which were answered after necessary inquiries had been made among other living relatives.

Peshkin made a study of about 300 children whom he had under observation for from one to two years.[11] A preliminary history was taken from the parents when the children were first seen. This was not very satisfactory or reliable; but as the parents returned with their children to the clinic time after time, they began to understand more about their offspring's condition. They became educated to appreciate the value of the information for which they had been asked. Consequently, when at the end of a year, the doctor again made a thorough inquiry about the family history, the parents were prepared to give satisfactory testimony. They had been making inquiries on their own among relatives. This is another way of increasing the reliability and completeness of the family history; education of the patients to an appreciation of what is desired.

CONSANGUINITY

The significance of being on good terms with the minister and the priest may be brought home to the doctor in his family history research. Patients sometimes deny the existence of cousin marriages in their family, when records kept by the church will reveal this

important information. It is important, especially in families where a rare condition has appeared in several instances. Frequently the consanguinity may be better expressed by a chart (as illustrated) than by words, especially if more complicated than first cousin relationship.

The country practitioner is again in a position of advantage when there is a question of doubtful parentage. It is sometimes difficult to be certain that all the children are actually the offspring of the adults who claim them. An intimate knowledge of the townspeople and of village bruits becomes invaluable at such a time. It is important to give reasonable attention to this question of parentage and to label and investigate suspected cases.

INTERPRETATION OF DATA

The practitioner is urged not to be discouraged because he does not see in his data any simple, consistent mode of inheritance. What seems chaotic to him may tie in beautifully with other data submitted to the medical geneticist. It is better to leave the interpretation to the specialist in medical genetics. The entire emphasis of the practitioner should be upon the collection of thoroughly reliable, detailed histories, with no attempt at selection of cases on the impression that some have greater "familial tendencies" than others. Records in the past were sometimes gathered by men who were inclined to select only such details as supported the theory of inheritance in which they believed. Such an unscientific procedure developed partly from their incomplete knowledge of the laws of inheritance. It was not then generally recognized that the mode of inheritance of some conditions may vary from one family to another,[12, 13] nor that through interaction between different hereditary factors, etc., complicated progeny ratios may appear.

A case is ready for use by the medical geneticist as soon as it is "complete". It is "complete" when all the essential information (*cf.* illustration above) has been obtained and estimations of the reliability of each item have been noted. A large series of such cases is needed by the medical geneticist before a worthwhile analysis can be made. For that very reason physicians are urged not to keep their cases to themselves until a thousand histories have collected! On the contrary, the cases should be contributed to the general fund so that the necessary number will be accumulated more rapidly.

AVAILABLE FACILITIES

The most important thing for the advancement of medical genetics is to have the complete and reliable histories published and available in the permanent records to all workers in this field. The medical journals are willing to publish a large series of complete family histories of a given condition. The following journals devoted to the specialty of genetics frequently publish individual cases of hereditary conditions (this list is not exhaustive): *Annals of Eugenics, Eugenical News, Genetica, Journal of Heredity, Journal of Genetics.** Further lists of journals with their addresses may be obtained from the Bureau of Human Heredity in London.† This is one of the most important agencies in the world for the collection and dissemination of data on human heredity. It needs the support of all physicians if it is to make its maximum contribution to medical science. In 1938 a Bulletin giving information for research workers in human heredity was first published. It gives notice of work in progress at institutions throughout the world (in English, French, and German).

The names of medical geneticists to whom work may be submitted for analysis can be obtained through the Bureau of Human Heredity. Individual cases or series of cases may be submitted to the Bureau itself. Dr. R. R. Gates,[14] council chairman, suggests that informants give details about the source of information, diagnostic symptoms, and the name and address of the physician reporting the case and willing to vouch for its accuracy.

In the United States, at Cold Spring Harbor, New York, there is another important repository for family history records. It is the Eugenics Record Office (founded by Mrs. E. H. Harriman), a part of the Department of Genetics of the Carnegie Institution of Washington.

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* Addresses of these Journals, respectively: University College, London, W.C.1; Cold Spring Harbor, L.I., N.Y.; Martinus Nijhoff, S'Gravenhage; 724 Ninth St., N.W., Washington, D.C.; 200 Euston Rd., London, N.W.1 (Amer. Agent: U. Chicago Press, 58th St. and Ellis Ave., Chicago).

† Bureau of Human Heredity, 115 Gower St., London, W.C.1, England.

PRACTICAL APPLICATIONS

It is impossible to do a routine neurological examination on all office patients. In the same way it is impractical to use the above outline of a family history for all patients. Then: "What conditions should be recorded?" There is no answer to fit the requirements of all physicians. The suggestion is made that most time be given in recording family histories of patients suffering from diseases which are the leading causes of chronic disability and death. These include mental disease, heart disease, cancer, nephritis, cerebral hæmorrhage, diabetes, etc.

Although the outline cannot be used for all patients, nevertheless the physician must know what facts are essential, so that when he is able to make a complete examination there will be no invalidating omissions.

Each specialist should make a practice of investigating some particular disease in his specialty. He should require his interns to use the above outline for the family history of all cases admitted with that disease. Geriatricians* will do well to concern themselves with studies on the inheritance of cancer, diabetes, and similar problems presented by our increasing population of old people. Then it will become easier to predict and prevent the onset of the same disease in relatives of the old patients.

The late effects of acute diseases have interested some medical men, but little is known about many of them. The author here presents a method for the study of that problem. It is necessary to separate the direct effects of the disease from hereditary effects which would have operated even if the disease had not been contracted. An example will make this clearer: trichinosis. Can a clinically "recovered" case ever be considered "normal" again? To determine this, it is necessary to make an estimation of what the patient's condition would have been if he had never ingested the worm-infested meat. This may be gained by a study of the persons who are constitutionally most similar (brothers and sisters). By the collection of a large number of family histories of such cases where the heredity and environment of the controls are nearly comparable to the heredity and environment of the patient, it will be possible to determine what degree of recovery may be expected. The monozygotic Twin Registry proposed above could provide some ideal material for this study.

CO-OPERATION IN MEDICAL GENETICS

A news item in the *Diplomate* reports that Professor Wiggers, of Western Reserve University,* made a plea for closer co-operation between clinical and laboratory men, to make the work of each more fruitful in controlling human disease.[15] One of the aims of this paper is to iterate his appeal.

By the co-operation of clinicians, geneticists, and statisticians the simple pedigree method can be replaced by more accurate statistical methods. Clinicians have the opportunity for doing research in the collection of family histories. From a great mass of such data (no individual lives long enough to gather *all* the necessary information by himself) a trained medical geneticist may extract what the geneticist or the clinical man is unable to get from isolated observations and his particular specialized training. The co-operation of all the other medical specialties is solicited so that medical genetics may advance rapidly to make its proper contribution to the other branches of medicine.

SUMMARY

1. Importance of medical genetics to (*a*) the general practitioner, (*b*) the specialist, and (*c*) the student.

2. Recommendation for the establishment of a national Twin Registry.

3. Outline of the essential details for a complete family history that will have statistical significance.

4. Explanation of outline.

5. Interpretation of collected data.

6. Facilities available for research workers.

7. Practical applications.

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ALLERGY IN CHILDREN*

BY GORDON CHOWN, M.D.

Winnipeg

THE importance of allergy in the field of medicine, particularly in pædiatrics, can easily be appreciated when one finds that approximately 7 to 10 per cent of our population suffer from some allergic condition. Since a large number of cases manifest themselves in the first decade of life, and respond more satisfactorily to treatment during this childhood period a general consideration of the subject should be of interest.

The diagnosis of the allergic condition is made perhaps more from a careful and complete medical and allergic history than from the other supplemental aids to diagnosis at our disposal. The taking of the allergic history, as suggested by Bray,[1] may be divided into predisposing factors, related to the onset of symptoms, and precipitating factors, specific and non-specific, which are related to the production of an attack.

A. **Predisposing factor** (related to onset): (1) Heredity: allergic predisposition has a strong tendency to occur in families. (2) Tissue trauma: severe illness before onset of symptoms, *viz.*: asthma; (*a*) pneumonia; (*b*) infectious disease, *e.g.*, pertussis, rubella.

B. **Precipitating factors** (related to production):

Specific: absorbed by: (1) *inhalation*: animals, hairs, feathers, dusts, pollens, moulds, fungi; (2) *ingestion*: foods, drugs; (3) *injection*: sera, drugs, bites, stings; (4) *infection*: bacterial allergy and worms; (5) *contact*: fabrics, chemical and physical agents. These are carried by the blood to the shock organ, with resultant allergic reaction.

Non-specific (catalysing factors): (1) dietary; (2) environmental; (3) toxic; (4) nasal; (5) psychic; (6) endocrine; (7) physical; (8) chemical; (9) mechanical. These lower the "allergic threshold" so that specific substances may act.

In infants and children, if careful inquiry is made, an allergic family history will be obtained in over 60 per cent of cases, which is more than 10 per cent above the general average for all ages. Allergic children, especially if very young, are also more likely to have a bilateral positive history of allergy.

In children the psychic factor plays no part unless the child receives too much sympathy from the parents, and develops wheezing respirations as a shelter complex. In adults with an allergic basis psychic factors may play a large part in recurring asthmatic attacks. Breathing can be accentuated by the emotions, *e.g.*, laughing, crying, fright, etc. An allergic adult, especially a female under emotional stress, can produce an attack of wheezing breathing with the hope of exciting sympathy. This, in my opinion, is the main reason why desensitization is not so successful in adults as in children.

Eczema is the commonest manifestation of allergy in infants. Most frequently it is confined to the face, and is very often associated with a cradle cap, but it may begin on the face and quickly become generalized. Ointments relieve the irritation, but they do not cure the condition. Eczema is usually self-limited, clearing up between the twelfth and fourteenth month. The last ointment to be applied, when the child is about to outgrow the condition, receives all the credit. I have never known weaning to cure an eczema. In the bottle-fed, if on a cow's milk formula, I always advise the use of evaporated milk, which in the very occasional case, due to the change in the protein molecule caused by heating, will clear the eczema.

In my opinion skin tests are of little value as far as obtaining a rapid cure by eliminating the positive food.

Elimination diets, especially for the child under two years, and for the most part for children over two years, are extremely difficult to carry out in the home, because of lack of

* Read before the Winnipeg Medical Society, November 17, 1939.

variety and the difficulty of obtaining co-operation from the mother. I have made very little use of the elimination diet in private practice. Restraint as carried out in the hospital is almost impossible in the home.

Flexural prurigo occasionally follows infantile eczema, and may persist into adult life. It is essentially chronic and very difficult to eradicate. Here again I am not impressed with results obtained from protein tests.

FOOD ALLERGY

During the pre-school age foods play a more important part than inhalants. After school age, with each year the inhalants play a more important part.

In infancy egg heads the list as a food producing allergic manifestations. With the introduction of egg into the infant's diet for the first time, I always warn the mother that if the baby breaks out in hives, vomits, or if loose stools develop, these symptoms are evidence of sensitivity to egg, and egg must at once be eliminated, and not tried again until 18 months.

A baby, one year old, suddenly developed a generalized urticaria. There was an allergic family history. Careful inquiry on my part failed to elicit the food at fault. The mother remembered that her brother could not eat potato. She eliminated potato from the child's diet, and the hives cleared up dramatically. She has since found out by her own experiment that she can give potato twice a week without reaction. I have instructed her to increase potato by a minimum amount with the hope of eventually desensitizing the baby.

This case demonstrates that some children can tolerate a small amount of one food, but if given in large amounts there will often be an allergic reaction. Quantitative inquiry is important in any investigation as to food.

Another doctor referred homologous twin girls, aged 8, with an allergic rhinitis, chronic cough, occasionally associated with wheezing respirations. I had seen the twins at the age of two in consultation for a persistent papular urticaria. Here the sense of smell was of great help in arriving at the diagnosis. During the first visit the odour of onions in the office was plainly evident. With the second visit the same odour caused me to inquire of the mother whether the twins were fond of onions. She replied that no meal was complete without onions, and instead of taking an apple to bed "to keep the doctor away", they each insisted on a bunch of green onions in the summer and in the winter, a Spanish onion. Further inquiry revealed an absolute distaste for milk. Milk had been forced since infancy. Distaste for any food should be given consideration in allergic investigation. Scratch tests were negative. Intradermal tests were definitely positive for milk, onions, and house dust.

Papular urticaria.—Six years ago I saw a Jewish child of eight years who was visiting Winnipeg from Chicago. The mother had consulted many physicians because of a recurrence of a papular eruption. The eruption was very irritable, and from the scratch marks resembled scabies, and it had been so diagnosed many times, with the result that the child would be eliminated from attending school. I made the diagnosis of papular urticaria and advised skin tests. When I came to pork I said to the mother "There is no need to apply it". She replied, "Yes, we are not orthodox, she loves bacon". The child gave a marked reaction. Bacon was withdrawn and the urticaria has not returned.

Gastro-intestinal allergy.—This may produce symptoms of recurrent pain in the abdomen, associated with or without vomiting. Intermittent attacks of diarrhœa with mucus and blood may occur. As illustrative of this type I shall briefly report a case.

D.W., male, came under my observation at three months in February, 1933, with a mild facial eczema which at first appeared at the age of one month. He was nursed six weeks. The grandmother had eczema; the mother was unable to eat apples. At the age of 4½ months he developed diarrhœa, with mucus and blood in the stool. He responded to dietary management. At six months the diarrhœa recurred, and from this time on, on an average of one a month, he had an attack of diarrhœa. In spite of this he continued to gain fairly well. I tried every known dietary management, eliminating milk, substituting sobee, eliminating wheat and eggs, all without success. With every change in diet the diarrhœa would be controlled for a time never exceeding two months. At five years of age skin tests were applied and showed him sensitive to the following: milk, egg, cheese, sardine, and to a slighter degree, parsnip, beet, celery, corn, pea, tomato, peanut, salmon, orange and yeast.

Dryco was prescribed as a beverage and for cooking. The foods were eliminated. At six years he has been free from diarrhœa for one year, and weighs 46 pounds (normal). His disposition has completely changed. He is very active and very happy.

The cases I have quoted justify the old axiom: "What is one man's food is another man's poison". The slogan "A quart of milk a day for every child", is excellent commercial propaganda but not necessarily good advice, not only from an allergic standpoint, but also because many children cannot ingest a quart of milk a day and eat a mixed balanced diet. May I interject here that ½ pint of milk at 11 o'clock recess for the underweight child at school is the best deappetizer for the noonday meal so far devised by those interested in public health.

Allergic rhinitis and asthmatic bronchitis.—A child with the history of repeated head colds, constant nasal discharge, associated with or without a chronic cough, especially if the symptoms are as persistent in the summer as in the winter, and more especially if the tonsils and adenoids have been removed without improvement, indicates the following investigation: (1) a careful inquiry as to allergy in the family history; (2) inspection of the nasal mucous membranes. If pale and œdematous, a nasal smear should be examined for eosinophils. If

positive, the diagnosis is allergic rhinitis. If in addition there are associated bouts of sneezing, watery eyes, itchy nose and pharynx, with a definite month of onset, pollinosis or hay fever is the diagnosis. If the symptoms are associated with periodic attacks of audible wheezing respirations, with an annoying, dry, non-productive cough at onset, the attack subsiding within three or four days with a loose productive cough, temperature rarely above 101°, the diagnosis is asthmatic bronchitis.

The case histories of five patients are presented.

CASE 1

D.S., a girl, present age 10 years. I first saw this patient in April, 1929, at the age of three weeks, with a facial eczema and cradle cap. The father had vernal conjunctivitis. At 2 years she had a persistent watery discharge from her nose. At 4 years she was having frequent colds, both summer and winter; a constant nasal mucoid discharge, also vernal conjunctivitis. The mother dated the onset of the colds from an attack of whooping-cough a year before. The chest was clear. Eosinophilia was present in nasal smear. Protein tests were refused.

I did not see her again until August 5, 1938, aged 8½ years. At 7 years the tonsils had been removed without improvement. In July, 1938, she was seen by a sanatorium superintendent who made a diagnosis of chronic septic infection at the base of the left lung, and referred the case to me.

She was 20 pounds underweight. The physical findings were confirmed, but eosinophilia was present in the nasal smear; nasal mucosal swelling of the allergic type; flexural prurigo at the flexures of the elbows. The signs in the chest cleared up in two weeks with inhalations and postural drainage; cough and nasal discharge persisted.

Protein scratch tests showed questionable sensitivity to a number of grass pollens (vernal conjunctivitis). Intradermal tests indicated multiple sensitivity with marked reactions to autogenous house dust and dog. The positive foods were eliminated from the diet but the family refused to do away with the dog. Desensitization had been refused. There has been no marked improvement in the condition.

CASE 2

E.F., female, aged 10 years, was admitted to the Children's Hospital out-patient department on April 11, 1939, for the investigation of recurring asthmatic attacks during the previous five years, following whooping cough. Between attacks she was constantly troubled with a running nose, sneezing and inflamed eyes.

The mother had bronchitis in England, but has been well since coming to Canada. A younger brother had infantile eczema. The nasal smear showed 16 per cent eosinophils. Blood smear showed 17 per cent eosinophils, otherwise normal. X-ray of the chest was negative.

She was admitted to the hospital on April 22nd for investigation. Scratch tests were all negative. Intradermals gave cat hair +++, horse hair ++++, house dust +++, rabbit, squirrel and cattle hair +, autogenous house dust (1:10,000) +++.

Treatment.—Two cats were removed from the home. Old horsehair furniture was also removed. The mattress and pillows were covered with rubberized sheeting. On May 2, 1939, desensitization with autogenous house dust was begun, and continued twice weekly until June 13th, and then weekly, and from September 26th a maintenance dose of 1 c.c. of 1/100 house dust was given weekly.

From April 22nd to June 6th the patient gained 12 pounds while in hospital. On June 18th she reported that she had had a mild spell of wheezing at night. She has had no attacks since that date although she has had several colds, unaccompanied by asthma.

CASE 3

M.W., a girl, aged 7½ years. Uncle has had asthma since infancy. The child was first seen at 6 months with eczema and urticaria. Mother thought that the onset was coincident with the addition of cream of wheat to the diet. Wheat cereals were removed from diet; an evaporated milk formula was given. The urticaria disappeared; eczema remained until 14 months. None since.

She was not seen again till 5½ years old (1937). At 3½ she had had a running nose and cough from April to September. At 4 the condition was diagnosed as whooping-cough and she was given injections without improvement. At 4½, again a running nose and cough but not so bad as the year before. At 5 she was treated by a nose and throat specialist by nasal packs and vaccine. At 5½ she had a constant cough, worse at night, and a persistent nasal discharge interfering with sleep. She was spending a week out of every month in bed. The nasal smear showed 30 per cent eosinophils. Diagnosis: allergic rhinitis and bronchial asthma. The following reactions occurred to proteins applied by the scratch test: chicken feathers, camel hair, grapefruit and pineapple, +; autogenous house dust, wheat proteose, +++; horse dander, apple, ++++; she also reacted to all common Manitoba pollens.

The foods were eliminated from the diet. A treatment set was made and desensitization carried out from August 27, 1937, to November 30, 1937, and she was given a maintenance dose monthly of 0.5 c.c. of a 1:10 dilution.

On Hallowe'en, 1937, she indulged in apples and peanuts and had an attack of asthma. Other than this she was free from symptoms throughout the summer.

CASE 4

S.C., female, aged 11 years, on September 8, 1939, was admitted to the out-patient department with a history of recurring asthmatic attacks since 1933, with no seasonal relation. Her dietary history suggested sensitivity to eggs and milk. She was placed on an egg and milk free diet without any improvement. On October 17th she was admitted to the Children's Hospital for investigation. The only family history of allergy was that her sister was sensitive to milk. A blood smear showed 20 per cent eosinophils, otherwise negative. The nasal smear was negative.

Scratch tests indicated sensitivity to cat hair, +++; horse hair, ++; cattle hair and house dust, +; beef, +++; whole milk, +++; mutton, ++; pork, +; cheese, +. On October 20th I caused the child to drink 8 ounces of milk. Within 20 minutes her face became flushed and she complained of headache and nausea. The symptoms passed off in approximately one hour. On October 21st beef was given with no apparent reaction. She was discharged on October 27th from the hospital with instructions to return to the out-patient department for desensitization, but to date she has not returned. Forty-eight hours after return to home she had a severe attack of asthma.

CASE 5

R.P., male, aged 10 years, was admitted to the Children's Hospital on April 14, 1939, with the complaint of a dry, non-productive cough for 8 weeks, recurring asthmatic attacks for the past six years. Since the onset of the cough he had had recurring bouts of fever. He developed eczema at eleven months

of age, which persisted intermittently until one year ago.

His father had a chronic cough, otherwise the family history as to allergy is negative. The boy dislikes fish, and for a time the asthma seemed to improve with the elimination of fish from his diet and the removal of pets and flowers from the house.

Two days after admission he developed a temperature with an evening rise to 102°. This persisted for one week. Physical examination of the chest was negative. Scratch tests indicated multiple sensitivity to animals, house-dust, pollens, and a great many foods.

Treatment consisted in: (1) desensitization for pollens; (2) desensitization for inhalants, cat, dog, horse and rabbit (the mother had two fur coats of rabbit origin); (3) elimination diet, excluding all foods which showed positive reactions; (4) breathing exercises; (5) dust-free room.

Discharged from hospital June 17, 1939; weight 52 pounds, a gain of 8 pounds during hospitalization. *Result.*—September 12, 1939, steady improvement during desensitization; he had slight allergic eczema on arms and legs in September.

I desire to thank Dr. V. H. Patriarche, Assistant Radiologist to the Children's Hospital for her co-operation in preparing and demonstrating x-ray films illustrating allergic cloudy antrums and allergic basal disease in the lungs in cases one, three and five.

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SONNE DYSENTERY IN AND AROUND VANCOUVER*

BY REGINALD WILSON, M.D., M.R.C.P.(LOND.)

Vancouver

WE are not accustomed to think of bacterial dysentery as a potent cause of ill health in a country with the temperate climate of our own. Reports[1, 2] from England and Scotland reveal that its recognition has increased greatly in these countries in recent years. My own experience in England and Vancouver has impressed me with the prevalence of this type of infection in the northern countries. Because of its usual mild symptomatology in these countries the high incidence of the disease is often overlooked, and, so, many experienced practitioners are unfamiliar with its true nature. Because it is unrecognized in its mild form it will occasionally spread as an epidemic amongst children and cause some deaths.

While a variety of types of dysentery bacilli have been recovered from the stools in sporadic cases and epidemics, it appears from recent statistics that the Sonne or Duval organism is the commonest offender in temperate countries. In fact, one authority[3] states that sporadic bacillary dysentery in the United States is caused more frequently by this organism than by any other of the dysentery group. On the other hand, Gibbons,[4] in a study of the sera agglutination titre of the general population of British Columbia and of mental hospital patients, found that 2.9 per cent of the former and 11 per cent of the latter showed agglutinins to the Flexner type of *B. dysenteriæ*, whereas none of the sera showed significant titres to the heat-killed antigen of *B. dysenteriæ*, Sonne. The same author pointed out that the infant mortality in British Columbia due to diarrhœa and gastro-enteritis was consistently lower than in any of the other Canadian provinces. He suggests from this and from the fact that the Sonne organism was seldom reported in stool cultures prior to 1936 that the incidence of Sonne dysentery was negligible in British Columbia. This is of interest as regards the geographic distribution of disease, because reported surveys from the Atlantic States and California recognize the prevalence of the disease in these districts.[6, 7, 8]

During the past few years, however, the number of stool cultures positive to *B. dysenteriæ* Sonne reported from the Provincial Board of Health Laboratories has risen sharply, and there has been at least one serious outbreak of the disease in one of the children's wards in Vancouver. It would seem from these facts that the disease *is* present in our community. Moreover, its recognition is apparently increasing, due possibly to more frequent use of the laboratory facilities for bacteriological examination of stool specimens. Certainly it would seem that its presence here is greater than Gibbon's figures of 1936 suggest. For example, in the university area alone (a population of a few thousand) in the past year four sporadic cases were discovered in the only four cases from which stool specimens were collected; there may have been many others. Then, also, in my own practice I have been able to collect 10 sporadic cases in the past year.

With the possibility in mind that still further use of the diagnostic facilities may reveal many

* A paper delivered before the Pædiatric Section of the Vancouver Medical Association.

more cases, I am taking the opportunity to describe some of the features of the disease and to record its occurrence in this district.

Epidemiology.—Of the 20 cases during the year 1937-38 at the Vancouver General Hospital 80 per cent were under ten years. Of the remaining 20 per cent the majority were noted to be very aged patients. This illustrates a well-known fact that the disease tends to be mild in young adults, more severe in old people, and frequently fatal in infancy. For example, in a family observed by Dr. Brandon, the City Epidemiologist, 5 children had diarrhœa, the severity of which was noted to be inversely proportional to the age. The father had only two loose stools, no pain, blood or nausea, yet he carried the organism for three weeks. In children's hospital outbreaks it is common to find that nurses may contract the disease, suffer such mild symptoms that they are not reported, and spread the infection by contact. Transmission may be so rapid that the theory of air-borne infection is attractive, but no proof of this exists and the organism is probably carried by contamination of food, drink, utensils, etc. Milk-borne epidemics have recently been reported.[5]

I have seen an example of the chronic carrier state in a young child with symptoms somewhat like those of ulcerative colitis. This must be unusual, and it is generally thought that the organisms disappear from the stools in 2 or 3 weeks but may remain 5 to 6 weeks or longer.[1] Such patients are a dangerous source of infection during the convalescent period. In an outbreak observed in a children's ward the incubation was noted to be 12 to 48 hours.

Pathological features.—The presence of blood and mucus in the stools during the acute phase suggests inflammatory congestion of the mucosa of the large bowel. In one personally examined case many minute hæmorrhagic extravasations and small shallow ulcers were noted in the mucosa by proctoscopic examination. In the occasional fatal case in infants the post-mortem reveals the principal lesion to be a severe fatty degeneration of the parenchymatous organs and the colon appears surprisingly healthy.

Clinical characteristics of the disease. — In children the disease begins suddenly with a rise in temperature to 102 to 103°, and the patient simultaneously complains of cramps, malaise and purging. The motions characteristically are liquid and often contain flecks of blood and a little mucus. The duration of the symptoms is variable, depending on the virulence of the organism, but usually the attack passes off quickly in 2 to 3 days and may be limited to 24 hours. A few children vomit, but this symptom may be absent throughout the illness, and vomiting is not usually a feature of the disease. As a rule the cramps pass off quickly, then the fever and malaise subside, and by the third day when the diarrhœa has lessened, the patient feels well but weak. Gradually the stools become formed and normal health is regained. Occasionally, in infants, severe hæmorrhage may occur and almost pure blood is passed per rectum. In these cases convalescence is prolonged until the blood is regenerated. The dangerous cases occur when virulence has been increased by passage in a large family or children's ward. In these circumstances toxicity is a feature and the disease rapidly proves fatal.

Diagnosis.—If this disease is suspected from the clinical characteristics the diagnosis can readily be confirmed in the acute stage by stool culture. It should be mentioned here that the disease cannot be diagnosed satisfactorily by recourse to agglutination tests alone, since the agglutinins to dysentery organisms develop after some delay and high titres are seldom attained. The most widespread error in diagnosis is to attribute the symptoms to "intestinal flu" or "something the child ate" and to overlook the actual cause by neglecting to take stool cultures. While gastro-intestinal symptoms may occasionally occur in epidemic influenza it is a common source of error amongst laymen and doctors to explain away a bacillary gastro-enteritis on this basis. Certainly, more frequent use of stool culture facilities will reveal that many of these cases have a bacterial etiology. In infants, the case must be distinguished from intussusception, based on the well-known clinical features of that disease, *viz.*, shock, rectal mass, and abdominal tumour. In older children and adults food poisoning must also be considered, and this differentiation rests on the history and on bacteriological examination of the stools.

The specimen taken for examination must be submitted *without delay*, as a negative report is not to be relied upon if the stool is more than 15 hours old before being planted. The technique recommended is to spread a loop of the fresh stool upon a lactose-litmus-bile-salt agar plate. After 12 to 18 hours' incubation sus-

picious colonies may be picked, emulsified in water, and mixed with specific serum. Immediate macroscopic clumping will confirm the diagnosis which can later be checked by growth on sugars. By this technique quick recognition (12 hours), prompt isolation, and concurrent disinfection of excreta will prevent epidemic spread of the disease.

Complications. — Rarely, but occasionally, Sonne dysentery is followed by a chronic phase which is in reality an ulcerative colitis. At this stage the organisms may be difficult to recover from the stool, but the blood will show agglutination in high dilutions. Silverman[3] suggests that the recovery of the organisms will be more certain in these cases if, previous to culture, the reaction of the stool is altered by a preliminary course (3 weeks) of acidophilus feeding. In infancy, dehydration and the accompanying biochemical disturbances are the complications to be feared and guarded against by the use of glucose salines. Very rarely, septicæmia with a typhoid-like course may develop and will be recognized by blood cultures.

Treatment.—As a rule Sonne dysentery is a self-limited disease, and treatment will consist of dietary measures and medication to relieve tenesmus. During the acute stages the diet should consist chiefly of glucose saline and milk with added protein. (A good method of accomplishing the latter is to add a protein powder, 6 to 8 tablespoonfuls, to the total day's feed of skimmed milk.) Dehydration will be combated by the use of oral or subcutaneous saline. In a few cases intravenous glucose saline must be given. In infancy this should be done with caution, as it usually requires immobilizing the patient, and the combination may predispose to pulmonary complications. Bismuth or kaolin preparations are useful, and their effect can be augmented by the addition of pectin and *small* doses of Tr. opii. In those severely ill patients with biochemical disturbance, regular administration of small doses (0.5 c.c.) of adrenal cortical extract is of great benefit, to support circulation. Transfusions are indicated occasionally for a similar purpose, but more especially in those cases where hæmorrhage is a feature. Sulfanilamide therapy has been tried and has not been successful in my experience. Anti-dysenteric serum seems most useful in the occasional chronic case.

Preventive measures are the most important weapon to attack this problem. Sonne dysentery is a notifiable disease in all the provinces of Canada. Prompt notification and isolation of individual cases will do most to prevent epidemic spread. It is interesting to note, from a recent German journal, that "in the last war dysentery headed the list of infectious diseases in the German army, with over 150,000 cases. Since then, in the present campaign, the results of vaccination against this disease have proved unconvincing."

During epidemics the possibility of an infected milk or food supply must be investigated. The isolation technique of the convalescent will be of the utmost importance in stopping the spread of the disease. Public health nurses and medical officers should be trained to recognize mild cases and, when the diagnosis is confirmed by the family physician, to assist him in carrying out strict isolation measures.

SUMMARY

1. A clinical description of Sonne dysentery as it occurs in Vancouver and district is recorded.

2. The previously low incidence of Sonne dysentery in British Columbia, which stood in striking contrast to the accepted incidence in California and eastern America, appears to be undergoing a change in recent years.

3. The suggestion is made that increased use of laboratory facilities would reveal a moderate reservoir of infection in this district.

I wish to express my appreciation to Dr. C. E. Dolman, Director of Provincial Board of Health Laboratories, for critical advice and to Miss Mary Gibson, B.A., for technical assistance.

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INJURY OF THE URETHRA IN THE MALE CHILD*

BY R. M. WANSBROUGH, M.B.

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IN the nine cases of injury of the urethra in the male child I have recently heard from or examined, and of which I have been able to get accurate records, the causes were accidents which we have all seen and possibly have met with ourselves in a less severe form. All the patients were between the ages of eight and thirteen. Boys of this age often walk the limb of a tree or a plank and fall astride it, or climb telegraph poles and, because their legs are too short to reach the full step easily, slip and land on the foot-piece. They ride bicycles down steps and are bounced off, to land on the cross-bar; they go sleigh-riding and their sleigh strikes the guy wire of a telegraph pole so that they are catapulted against the wire. The last, and of late years the most common, method of injury is due to the motor car. There has been a marked increase of injuries to the urethra secondary to fracture of the pelvis in motor accidents since cars have become so numerous.

Aside from the motor accident cases, the nine boys of whom I speak did not have what is commonly associated with injury to the urethra in adults—shock. On the contrary, four of them went many hours without much complaint. All of them had blood at the external meatus, and on attempting to urinate had severe pain in the perineum and at the base of the scrotum. On examination, besides the finding of blood at the meatus, there was distinct swelling and tenderness in the perineum with, in all cases save one, a distended bladder; this child had also a rupture of the bladder. On attempting to pass catheters, in only one was I able to get into the bladder; this was the only case where there was not a complete tear. All except the partial tear were treated by opening suprapubically into the bladder, and in six out of the nine cases the bladder was stripped from the pubes by blood so that one could look down in front and see the sound in the urethra and the one coming from the bladder through the short portion of the urethra remaining. Therefore, the largest catheter possible (16 to 22 French) was passed. When it was in the bladder a heavy silk suture was put through the end and drawn up through the suprapubic wound. The pouch of Retzius was drained and a suprapubic catheter sewn in, for the purpose of irrigation and also to keep the patient dry. In the case of the boy with the partial tear the margins of the wound were excised and the urethra repaired about a catheter.

From now on, unless (as is frequently the case in motor accidents) the patient has other injuries, he will do well, provided it is not necessary to change the catheter. The present irrigation equipment should eliminate this need. If, on the other hand, a catheter is allowed to plug or slip out, the chance of a good recovery is at once decreased. The patient either gets leakage of urine with resultant inflammation, or a healing wound is traumatized by putting back the catheter, thus converting a traumatic stricture into an inflammatory one. Where this accident did not occur, the wounds were for the most part completely healed in three weeks. This was true of five of the group. In one case the catheter was plugged all night. Morphine was administered for the patient's pain, and he urinated around the catheter. The result was nine months in hospital, in a case which was probably the most favourable of the group. The other two patients died, one of peritonitis as he had ruptured the bladder as well as the urethra, and a second due to multiple injuries with the urethra completely separated from the bladder.

Care is not ended when the wounds are healed. Such patients must be dilated at definite and frequent intervals. If one takes the word of the child or his parents that it is "all right", he invariably comes back with the stricture so small that there is great difficulty in passing the smallest sound, and as a result the urethra is nearly always damaged, resulting in further scarring. It has been my prac-

* A paper read before the Urological Section of the Academy of Medicine, Toronto, November 10, 1939.

tice to keep patients in hospital for a short period after complete healing, during which time they are gently dilated every second day. They are then allowed to go home, coming back Saturday morning of each second week, when they are given a gas anæsthetic, as I find they are tense under a local, and as a result more difficult to dilate, and there is more chance of injury. If at the end of a month there is very little contraction the intervals between dilatations is increased to a month, then two months, three months, etc., and it has been my practice to dilate boys of eleven to thirteen years up to 25 French, provided this does not make them bleed. If this procedure is carried out I do not believe that the end-result of tears of the urethra will be serious.

In conclusion may I point out that these boys were free of shock except for those who had other injuries, as in the case of motor accidents. They all had blood at the external meatus; without exception they had pain on attempt at urination, at the base of the scrotum and in the perineum. The bladders were all distended except where there was a complication, as a ruptured bladder. The results are good if suprapubic drainage and an inlying catheter is left in until the lesion is healed, and if, finally, gentle dilatation is carried out over a long period of time.

COLLES' FRACTURE

By A. W. M. White

Toronto

TWO years ago, at the Toronto Western Hospital, investigation of a number of Colles' fractures which had been treated during the previous year brought us to the conclusion that the percentage in which good function was regained was disappointingly small. We felt that our results were not inferior to those obtained generally, and therefore the present study was undertaken to ascertain if possible the measures that can be taken to make good results of treatment more general.

The cases have been classified according to their states after treatment, into those with good, fair, or poor function. Good function signifies there is full painless movement of all joints of the hand and arm, no impairment of strength nor of ability to work. Fair results are those in which there is slight limitation of wrist movements, slight loss of strength or slight pain, *e.g.*, aching on damp days, etc. Poor results are those in which the tips of the fingers will not reach the palm, or there is definite impairment of strength or of wrist motion, or for some reason the hand is definitely not as efficient as previously. We have found it impossible to get more than about 25 per cent of patients with this injury to return to the Follow-up Clinic as long as we should like them for study. Possibly this is because the other 75 per cent are having no trouble. We know this is often the explanation, and we hope it is the usual one.

The present series comprises 66 out of a total of 230 cases treated in the Emergency Department during the past three years. They were treated by the six members of the Attending Surgical Staff, and after treatment was finished were followed for periods varying from 3 to 12 months in the Fracture Follow-up Clinic, by Dr. L. T. Barclay and the author.

All 66 patients were between the ages of 45 and 70 years. There is seldom any trouble in the treatment of Colles' fracture in children and young adults, and we felt this age-group would be most instructive. The results in this series seem to show that the patient of 70 has as good a chance of regaining good function as the one of 45. Local and general anæsthesia were used, and the choice of one or other had no demonstrable effect on the final outcome.

In a Colles' fracture the lower fragment of the radius is displaced radially and backward and is rotated radially and backward. There is also shortening of the bone, due in varying degree to the above changes in position of the lower fragment and to impaction of the two fragments. When reduction is brought about it is frequently observed that there is a V-shaped space between the fragments on the posterior surface of the bone. This is obviously

TABLE I.

MANIPULATION AND A.P. SPLINTS

	Good		*Moderate*		*Poor*		
	Deformity	*No deformity*	*Deformity*	*No deformity*	*Deformity*	*No deformity*	*Totals*
Splinted 3 weeks — With loss of substance	2	0	3	0	3	0	8
Splinted 3 weeks — No " " "	0	4	0	0	0	0	4
Splinted 4 weeks — With loss of substance	2	2	7	0	3	0	14
Splinted 4 weeks — No " " "	0	5	0	0	0	1 (arthritic)	6
Splinted 5 weeks — With loss of substance	0	6	2	1	0	0	9
Splinted 5 weeks — No " " "	0	1	0	0	0	0	1
Splinted 6 weeks — With loss of substance	0	0	2	0	1	0	3
Splinted 6 weeks — No " " "	0	2	0	0	0	0	2
	4	20	14	1	7	1	47

TABLE II.

TRACTION AND WIDE POSTERIOR SPLINT

	Good		*Moderate*		*Poor*		
	Deformity	*No deformity*	*Deformity*	*No deformity*	*Deformity*	*No deformity*	*Totals*
Splinted 3 weeks — With loss of substance	0	0	1	0	0	0	1
Splinted 3 weeks — No " " "	0	0	0	0	0	0	0
Splinted 4 weeks — With loss of substance	0	2	0	0	0	0	2
Splinted 4 weeks — No " " "	0	4	0	0	0	0	4
Splinted 5 weeks — With loss of substance	0	5	0	1 (arthritic)	0	0	6
Splinted 5 weeks — No " " "	0	0	0	0	0	0	0
Splinted 6 weeks — With loss of substance	0	4	2	0	0	0	6
Splinted 6 weeks — No " " "	0	0	0	0	0	0	0
	0	15	3	1	0	0	19

due to the posterior cortex having been crushed by the impaction, and is referred to as "loss of substance". It is similar to the V-shaped loss of substance sometimes seen in a vertebral body after reduction of a compression fracture there. Study of this group of cases shows at once that there was no deformity after treatment of any of the 17 cases where there was no loss of substance—no matter what the type of splinting or how long immobilization was carried out.

The relationship of recurrence of deformity to inferior function is also worth noting. Of the total number of cases 49 obtained good function: of these only 4 had any deformity. Of the 19 regaining only moderate function there was some recurrence of the deformity in 17. Of the 8 with poor function deformity recurred in 7, and the other case was a woman who suffered from severe chronic arthritis.

Since deformity is so closely related to poor function it is desirable to note the factors which tend to result in deformity. These are four in number. The first is obviously poor reduction. In the cases studied the reduction, while not always perfect anatomically, was never what could be called poor, and in cases where deformity is stated to have recurred the deformity was always much greater than that present immediately after reduction, as shown by radiography. Accuracy of reduction is thus not considered in this series. The second factor is loss of substance. It is evident that deformity may recur with greater ease if the posterior cortex is lacking at the fracture site. The third factor is length of immobilization.

It is evident that if accurate reduction be maintained continuously until solid bony union is present deformity cannot recur. Fourthly, inefficiency of immobilization may, of course, allow recurrence of deformity by failing to prevent movement between the fracture fragments.

Considering only those cases in which there was loss of substance, of 9 cases splinted 3 weeks, only 2 obtained good function, all 9 showing recurrence of deformity. In 16 splinted 4 weeks good function resulted in only 6, and only 4 had no recurrence of deformity. In 15 cases splinted 5 weeks, good function returned in 11 and deformity recurred in only 2. Of 9 cases splinted 6 weeks 4 regained good function. In all 5 cases splinted 6 weeks, with less than perfect functional result, there was recurrence of deformity, so it is fair to conclude that the splinting was not efficient.

Two methods of treatment were carried out in this series. In 47 the long-recognized manipulation of breaking down impaction by increasing the deformity, followed by reduction by carrying the hand into flexion and ulnar deviation and manually correcting the backward and radial displacement of the lower fragment, was used. Fixation was obtained by application of a posterior splint from the metacarpo-phalangeal joints to just below the elbow and an anterior splint from the mid-palmar crease to the same height. These were fastened in place by a bandage of flannellette cut on the bias. These cases are listed in the Table under A.P. splints.

The second method was that described by Bohler. In this, the reduction is carried out as follows. The patient is placed in the supine position with the arm of the affected side abducted and internally rotated at the shoulder and the elbow in semiflexion so that the hand points toward the foot of the table. An assistant grasps the thumb in one hand and the index and middle fingers in the other and exerts steady traction of 12 to 15 pounds in the long axis of the forearm. Counter traction is obtained by a band about the upper arm fastened to the wall at the head end of the table. A 2-inch square of silence cloth is fastened over the base of the thumb and radial styloid by mastisol and another in the first interdigital cleft. Pull on these three digits results in lengthening of the radius and ulnar deviation of the hand. Under general anæsthesia for about two minutes and under local anæsthesia for 5 to 8 minutes pull is required to undo the impaction and cause a definite separation of the fragments. We have had none that could not be disimpacted in this way. A slight forward pressure on the lower fragment then will nearly always result in perfect reduction. While the pull is kept up on the digits a plaster splint, 7 inches wide, is applied wet to the back of the hand and forearm from the metacarpo-phalangeal joints to about 2 inches below the point of the elbow. This splint is trimmed so that it embraces the medial and lateral borders of the hand to prevent lateral movement, but does not come around to the palmar surface. It is bandaged in place by means of a wet 3-inch gauze bandage, and as it dries is carefully moulded about the wrist joint and base of the thumb. If the fluoroscope shows that the lower radial fragment is slightly backward, it is held forward by the operator's thumb pressing slightly on the plaster just at the required point until the splint is hard. Once the splint is hardened, the bandage may be cut along the volar surface of the wrist and forearm and a new bandage applied if swelling causes circulatory obstruction, and since the splint encircles about three-quarters of the wrist circumference there is little chance of disturbing the position of the fragments. The shape of this splint adds so to its strength that it can be made very light with safety.

In cases where there is much swelling at the time of reduction it is necessary to remove the splint after a few days when the swelling has subsided, a slight pull being put on the thumb and fingers the while, and to apply a new splint. If this is neglected sufficient play will be allowed to endanger the maintenance of reduction. This splint is lighter than a circular cast, and the gauze bandage across the palm allows very free use of the fingers during the whole period of immobilization.

The usual part of the deformity to recur is that which results in radial deviation of the hand and is made up of radial rotation of the lower fragment and shortening of the radius. It has been pointed out that loss of substance is an important factor in this recurrence, and it is surely evident that disimpaction by increasing the deformity would tend to increase the amount of substance lost by further crush-

ing the posterior cortex. If this single wide splint is applied with only the small pads mentioned and carefully moulded to the part it will be impossible for the fragments to move on each other, and this recurrence of deformity is prevented. In all cases active use of the hand is encouraged after the first three or four days. This is undoubtedly a great factor in producing a good functional result.

In this series the wide posterior splint method was used in 19 cases, with excellent results in 15. In the 4 imperfect results the splint was removed after only 3 weeks in one; one was a severe arthritic and in two cases the splint was applied in the presence of swelling and not renewed when this disappeared, so that deformity recurred. Even so, a good result was obtained in 79 per cent of cases.

Of the 47 cases treated by the first method a good result was obtained in only 51 per cent. This would seem to be due to the fact that the usual antero-posterior splints do not prevent lateral movement of the wrist, and so do not prevent movement between the fragments and recurrence of deformity.

SUMMARY AND CONCLUSIONS

1. The results in a series of 66 Colles' fractures are reviewed in patients between 45 and 70.

2. The age of the patients between these limits and type of anæsthesia have little effect on the results.

3. Loss of bone substance by compression and impaction is a most important factor in causing recurrence of deformity. This is increased by the manœuvre of increasing deformity to disimpact the fragments.

4. Comminution of the lower fragment prolongs disability.

5. Recurrence of deformity is commonly associated with an imperfect functional result.

6. Evidence is presented in favour of the reduction by longitudinal pull and fixation by a three-quarter posterior splint.

7. A minimum of 5 to 6 weeks is required for firm union to take place.

8. Active use of the hand during treatment is a very great factor in regaining good function.

A CASE OF BRILL'S DISEASE

BY J. E. NICHOL, M.D., C.M.

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BRILL, Baehr and Rosenthal,[1] of Mount Sinai Hospital, New York, in 1925 reported their observations on a condition, not believed to have been previously described, which they designated as "generalized giant lymph-follicle hyperplasia of lymph nodes and spleen". They described three cases. One patient died following splenectomy and no autopsy was obtained. The other two were alive and in apparent good health at the time the report was made. Splenectomy was performed on one, but the other was treated entirely by x-ray, with satisfactory results. It was observed that all the lymph nodes throughout the body were enlarged.

In their first report these investigators stated that the hyperplastic process was apparently benign. But in 1927 Baehr and Rosenthal came before the American Association of Pathologists with a further report on the same condition which they now termed "malignant lymph follicle hyperplasia". In 1931 Baehr and Rosenthal, this time in collaboration with Paul Klemperer, before the same Association, once more discussed the condition, stating, "The disease is a form of lymphosarcoma which deserves to be distinguished as a pathologic entity because of its characteristic pathology, its unique pathogenetic evolution, and its unusual duration. It may form a connecting link between the systemic hyperplasia of the lymphatic tissue and lymphosarcomatosis". To distinguish it from other varieties of lymphosarcoma it was proposed to term it "Follicular lymphoblastoma". Lymphoblastoma is defined by Mallory[2] as a tumour of mesodermal origin, the cells of which tend to differentiate into lymphocytes, that is, cells of the lymphocyte series, as the lymphoblast, which is the type, under normal conditions may differentiate first into lymphocyte, and thence to what we term a "lymphoid cell". It is not

difficult to foresee that, under pathological conditions such changes may take place with far greater rapidity and variation than is usual in health.

Much obscurity still clouds the picture; etiology, pathogenesis, and clinical symptoms must be cleared up by the slow accumulation of data supplied by individual practitioners. It is, therefore, of importance that all such data should be put on record, and I believe this is the first case recorded in a Canadian journal, although one of Symmer's cases was referred from Hamilton, Ont.

According to Ewing and Fein,[3] the salient characteristics of the condition can be listed as follows: (1) Lymphadenopathy due to hyperplasia of the germinal centres of the lymph follicles. (2) Splenomegaly due chiefly to enormous enlargement of the Malpighian bodies, the weight of the spleen increasing up to 800 g. (3) Absence of abnormal cells in the blood. (4) Absence of anæmia or cachexia. (5) A tendency to development of serous effusions in the pleural and peritoneal cavities, due to pressure of mediastinal or abdominal lymph nodes upon venous or lymph vessels. (6) Absence of involvement of tonsils and lymphatic apparatus of the gastro-intestinal tract. (7) A tendency to lymphatic infiltration in a lachrymal gland resulting in unilateral exophthalmos. Clinically, the condition bears a noteworthy resemblance to Hodgkin's disease, lymphosarcoma, and lymphatic leukæmia. Histologically, it is different from all of the above in that the enlarged nodes show replacement of their normal architecture by dimensional and numerical hyperplasia of the follicles, sometimes with similar alterations in the follicles of the spleen. According to Symmers[4, 5] the cases can be separated into two groups: first, those in which the hyperplastic follicles in the nodes and spleen retain their structural identity for months or years, or the nodes may undergo reduction in size or disappear temporarily for no apparent reason, or they may show histological signs of healing irrespective of treatment, or they may rupture spontaneously and heal; second, those cases in which the condition alters its course, as was shown by Symmers for the first time. In the latter group (*a*) the lesion may undergo direct transformation into a polymorphous cell sarcoma, or (*b*) it may become associated with the histological changes of Hodgkin's disease, or (*c*) with the changes of lymphatic leukæmia, or (*d*) with those of an apparently unique disease characterized among other things by late necrotic lesions in the follicles of lymph nodes and the spleen. In still other instances the combination of giant follicular lymphadenopathy, polymorphous cell sarcoma, and Hodgkin's disease may be observed in the same lymph nodes.

Symmers states that enough cases have been collected to demonstrate that giant follicular lymphadenopathy, although not well known, is not rare, and that is of clinical importance, largely for the reasons that it is easily recognized histologically, and is usually rapidly submissive to mild x-ray therapy, to which it may remain amenable over an expanse of time such as to indicate prolongation of life.

CASE REPORT

No. 74946.—A well nourished male, aged fifty-three years, presented himself for examination complaining of a painless swelling in the right side of the neck. He had always been a particularly strong, active, virile man. He stated that about a year previously he had noticed a lump under the right jaw. Several months later he had noticed a further swelling over the right collar bone. His physician was consulted, and a section taken for pathological examination, but the report on the tissue was non-committal, merely stating that there was no evidence of malignancy or Hodgkin's disease. The patient felt well in every way, but the increasing size of the lumps in the neck was a source of worry. There had been no loss or gain of weight in the past year.

Family history.—His father died at seventy years of age from sarcoma of the right femur. His mother died at thirty-four years in childbirth. There was no familial history of diabetes, insanity, epilepsy, or tuberculosis.

Physical examination.—A well proportioned male about the stated age with a noticeable swelling in the right side of the neck. Pulse, 57, regular, good volume. Temperature, 98° F. Blood pressure, 130/88.

There was a mass in the right supraclavicular region about the size of an orange, firm in consistency, practically fixed, but not tender. The mass seemed to be made up of a chain of glands. The tonsils were slightly enlarged, with evidence of some chronic inflammation. The teeth showed some pyorrhœa, but x-ray demonstrated no infection of the roots.

Chest.—There was some slight enlargement of the heart to the left. The heart sounds were regular with no murmurs. The lungs were normal to percussion. No râles were heard.

Abdomen.—There was no tenderness over the abdomen. The spleen was not palpable. The lower border of the liver could be felt just below the costal margin.

There was no tenderness on deep pressure of the kidneys, ureters, or bladder, and no masses were palpable.

Genitals.—They appeared normal. In the right inguinal region the lymph glands were moderately enlarged and somewhat fixed.

The extremities were negative; rectal examination was negative.

X-ray of the chest.—Lungs negative. The heart was slightly enlarged to the left. The mediastinum appeared to be within normal limits.

Laboratory tests.—Urine—clear acid, 1.010; alb., 0; sugar, 0; microscopically negative. Blood—hgb. 101 per

cent (Sahli); white blood cells, 6,200; red blood cells, 5,120,000.

A blood smear stained with Wright's stain showed no abnormalities in either white or red cells.

Diagnosis.—A provisional diagnosis of Hodgkin's disease was made.

Course.—Under local anæsthesia the mass in the right side of the neck was excised. It extended down under the clavicle to the dome of the pleura, and back, just under the upper portion of the scapula. It was necessary to tie off the external jugular during the operation. The surgical wound healed well within ten days.

The material was sent to a pathologist who made a diagnosis of lymphoid hyperplasia. The pathologist also sent sections to Dr. James Ewing, of New York, who reported as follows—

"This is a case of multiple follicular hyperplasia of lymph nodes (Brill's disease). It is generally very widespread and systemic, runs a slow course, is very sensitive to radiation, which is the treatment of choice, but generally recurs, and proves fatal in five or six years or less. I suspect, but cannot assert, that it is related to Hodgkin's disease. One should persist in moderate x-ray treatment."

About two months later, the patient having complained of sore throats, the tonsils were removed under local anæsthesia without incident. The pathologist's report on the tonsil tissue showed lymphoid hyperplasia with fibrosis.

He progressed favourably for about one year. He then contracted a severe chill while out hunting, and developed a pain in the right lower costal area which was diagnosed by his physician as an intercostal neuralgia. Under local treatment he did not progress favourably, and was sent in to the hospital.

The patient had become distended and vomited large quantities of foul-smelling material, suggesting a partial bowel obstruction. On examination there was no enlargement of the mediastinum to percussion. There was no tenderness over the abdomen, and under appropriate treatment the distension became much less and vomiting ceased. However, the volume of urine decreased markedly, and he showed signs of uræmia. The blood urea gradually increased. Phenosulphonpthalein, given intravenously, was, practically, not excreted in two hours.

A blood transfusion of 450 c.c. citrated blood seemed to help greatly, and the volume of urine again increased. It was felt that the condition was a recurrence of his former state, and deep x-ray therapy was given over both kidney regions and over the mediastinum. The patient did not respond to treatment, and died two weeks after admission.

The autopsy findings were of great interest. A mass was revealed in the mediastinum, which measured 5 x 4 x 3 cm.; an abdominal mass that was retroperitoneal, and completely surrounded both kidneys, ureters, and the bladder, and was removed *en masse* without difficulty. Sections of tissue removed were reported as lymphosarcoma with marked invasion of the adrenal, kidney, ureter, and bladder, which explained the poor renal function. The spleen was somewhat enlarged, but there were no other findings of interest.

SUMMARY

1. A case of multiple follicular hyperplasia of the lymph nodes is presented.

2. The patient lived 2½ years after the onset of symptoms.

3. Mild x-ray therapy is the method of choice in treatment.

4. This case terminated as a lymphosarcoma.

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FRACTURE OF THE FIRST METACARPAL BONE*

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IT was in 1881, before the Dublin Pathological Society, that Edward Holloran Bennett first presented this important subject of fractures of the first metacarpal bone. His first series of cases, five in number, were found in the dissecting rooms, and led him to take an active interest in the subject. He realized the great importance of all movements of the thumb, and saw how they were interfered with in these fractures. In his series of cases, an oblique fracture of the base involving the articular surface was the most frequent and is the one which bears his name. At first he described it as occurring in the right thumb only, but later mentioned several cases in the left thumb.

Fractures of the first metacarpal have retained their importance. They regularly occur from a blow on the end of the first phalanx, from a blow or fall with extension of the fully abducted thumb, or from a direct injury. The neck and shaft are rarely fractured, but the base is a common site. Here three main types occur: (1) an irregularly transverse or oblique break which does not involve the carpo-metacarpal joint and is usually impacted; (2) a separation of the epiphysis, which does not fuse with the shaft until the eighteenth year (the ossification of the first metacarpal is similar to that of a phalanx); (3) an oblique fracture of the base involving the joint (Bennett's fracture).

* From the Fracture Service, Winnipeg General Hospital.

Since 1929 there have been 13 cases of fracture of the first metacarpal in the Winnipeg General Hospital. Of these, 7 were oblique or transverse fractures of the base not involving the joint; 3 were of the Bennett type; 1 a separation of the epiphysis; 1 a comminuted fracture, and 1 a green stick fracture of the shaft.

Diagnosis.—There is a history of injury, followed by loss of power and pain in the thumb. Tenderness is elicited at the base of the metacarpal and in the anatomical snuff-box. No abnormality in position is as a rule present in fractures of the neck, shaft, and only occasionally in transverse fractures of the base. Deformity may be seen in the Bennett's type where the distal fragment is drawn upwards and backwards with a tendency to outward bowing. Swelling in the region may be so marked as to obscure the displacement which will become apparent in the x-ray film.

Treatment.—In transverse fracture of the base or separated epiphysis impaction is common, and occasionally reduction is difficult. This is performed under a general or, if preferred, a local anæsthetic. When reduced, recurrence of the displacement is unusual. Many of these cases are neglected and the patient presents himself with a backward projection of his metacarpal. This deformity limits abduction a little but causes no interference with function. It is best treated in a plaster cast which incorporates the forearm and wrist. The plaster is moulded about the extended and abducted thumb and extends down to its interphalangeal joint. Immobilization for four weeks is necessary. The cast is then removed and active movements are carried out. Firm union and good function are present in another two weeks.

The treatment of Bennett's fracture is more difficult, as displacement is liable to recur after reduction. The fracture occurs after the thumb is first subluxated outwards. The break is an oblique one so the distal fracture passes upwards and backwards, leaving the beak-like proximal fragment in its normal position. Reduction is easily attained by simple traction, and, with pressure over the base of the metacarpal, reduction is maintained.

This fracture has been treated by many methods but only a few of them will be briefly discussed.

1. The abducted extended thumb is incorporated in plaster and retained in position by means of a plaster cuff about the wrist. At the end of three weeks the cast is removed and the thumb strapped with adhesive plaster to protect the fracture. This is removed at the end of two weeks.

2. As there is a tendency for a recurrence of the deformity, due to the obliquity of the fracture and a strong muscle pull, some recommend constant traction. This is maintained by means of a banjo splint incorporated in a plaster about the wrist which immobilizes it in moderate dorsiflexion. Traction of the distal fragment is obtained by means of adhesive plaster to the skin or by a needle passed through nail, pulp or bone of the terminal phalanx. The frame is bent in such a way that the traction force is applied with the metacarpo-phalangeal joint in full abduction and opposition. Immobilization is maintained for three weeks and is followed by "active and passive" movements.

3. Probably the simplest line of treatment advocated is to place a roller bandage between the thumb and index finger and to strap the thumb over it with adhesive.

4. A series of 73 cases reported by Roberts, of Liverpool, were treated in plaster, with the thumb abducted and extended. The cast incorporates the wrist and forearm. A wire forming a small Thomas' splint for the thumb is incorporated in the cast. The fracture is reduced, and then a small felt pad is held firmly over the fracture by adhesive. This prevents displacement. It is necessary to retain this apparatus for six weeks. Good results are attained except in comminuted cases. Where slight displacement occurs an osteo-arthritis develops in the carpo-metacarpal joint. The pain is not so severe as to keep a labouring man away from work.

In the Fracture Clinic of the Winnipeg General Hospital it is recommended that the fracture be put up in plaster, incorporating the forearm and wrist. The wrist is slightly dorsiflexed, and the thumb is in the neutral position with its palmar aspect facing the little finger. A small piece of felt is placed over the dorsal aspect of the base of the first metacarpal. Pressure of the plaster on this prevents displacement of the fracture. The terminal phalanx is not included in the plaster but is left free so that active movements may be carried out from

the beginning. Passive movements are never recommended in the treatment of any of our fractures. Banjo splints are avoided because traction on the fingers causes a marked stiffness in the interphalangeal joints which is not readily overcome. It may be necessary, however, to use them in comminuted fractures where there is much displacement. The cast is worn for from five to six weeks. On its removal the normal range of movements rapidly returns as the thumb has been in a resting position and not the strained one of abduction and hyper-extension as recommended in some methods.

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TETANIA PARATHYREOPRIVA

(WITH REPORT OF A CASE)

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HYPOPARATHYROIDISM produces a condition recognized as tetany and may be either manifest or latent. The disease may occur spontaneously, the so-called idiopathic variety; or, more frequently, it follows operation for the removal of part or all of the thyroid gland. The state of hypoparathyroidism may be acute and easily managed until cured, or chronic, when it will require constant treatment throughout the remainder of the patient's life.

Spontaneous or idiopathic tetany may occur in families and is more prevalent in certain regions than others.[1] The cause of the disease is not definitely known but many factors and theories are described. Collip[2] states diet and the type of flora of the alimentary canal of parathyroidectomized animals are very important. Metabolic abnormalities are also cited as causative factors, *e.g.*, the decreased permeability of the mucosa of the gut, formation of insoluble soaps, increased intestinal rate, and an increased pH of the upper intestinal tract, all resulting in a lack of calcium absorption.

Cases of parathyroid tetany have shown a marked decrease in the excretion of calcium and phosphorus in the urine and a normal excretion of calcium by the bowel, in spite of a low blood calcium and a high phosphorus.[3] The opposite is the case in hyperparathyroidism. These observations were confirmed and reported in our case concerning urinary excretion of calcium and phosphorus.

The cause of post-operative tetany in thyroidectomy is quite obviously due to removal, damage, or injury to the blood supply of the parathyroid glands. Swinton,[4] in an article on post-operative parathyroid tetany, describes fully the way to avoid injury to these glands. Two per cent of thyroidectomy patients develop tetany.

CASE REPORT

Theresa W., aged 12 years, was admitted to hospital, March 31, 1939.

Complaints.—Feverishness, pain in the forearms and legs, and convulsions for 5 days; itching of the arms for 4 days.

Family history.—Negative.

Past illnesses.—Ruptured appendix on October 17, 1935, followed by pneumonia and collapsed lung; recovery otherwise uneventful.

Present illness.—In May, 1936, the patient developed cramps in the calf muscles while walking to school. A diagnosis of tetany was made at this time, but the parents refused treatment. As the summer progressed this cramping of the muscles subsided, but returned again on September 16, 1936. This time it not only involved the leg muscles but the arms and face. Chvostek's and Trousseau's signs were present.

The blood calcium at this time was 7 mg. per 100 c.c. The parents refused hospitalization but agreed to treatment at home. The girl was given calcium chloride and viosterol. In three days she was much improved and was carried along for two months on the above treatment. No further blood chemistry tests were available, and for the following three years she was seen only occasionally. During this interval she was symptom-free.

On March 26, 1939, she was again seen and at this time had generalized tetanic convulsions with all the signs of tetany. This attack had come on in two days following a severe upper respiratory infection. Owing to her grave condition calcium gluconate was given intramuscularly at once, followed by large doses of calcium chloride and viosterol. The convulsions ceased in twelve hours and the patient was much improved in four days. She was then admitted to the hospital for observation and investigation on March 31, 1939.

Physical examination showed the following positive findings: (*a*) not acutely ill; (*b*) tonsils enlarged and inflamed; (*c*) Chvostek's sign bilaterally present.

Laboratory findings. — Urine, negative. Tuberculin skin test, negative. Red blood cells, 6,300,000; white blood cells, 7,600; polymorphonuclears, 80 per cent; lymphocytes, 20 per cent. The blood Wassermann test

was negative. Blood calcium, 7.0 mg.; blood phosphorous, 7.0; non-protein nitrogen, 29 mg.; creatinin, 87 mg. X-ray of the long bones showed no abnormality. Electrical tests on the peroneal nerve showed: K.C.C., 0.4 to 0.5 milliampères; A.C.C., 1.2 milliampères; A.O.C., 1.2 milliampères; K.O.C. was not measured due to the fact that too much current was required.

Treatment and progress.—The child was not given any calcium by mouth for the first five days in hospital, and after that period the blood calcium was found to have dropped to 6 mg. and the blood phosphorus was 12.2 mg. At this time the Chvostek's sign was very marked and a slight Trousseau was present.

She was given 50 gr. of calcium chloride as an initial dose, and then 20 gr. q. 4 h. with 5 and 15 minims of percomorph b.i.d. and placed on a low phosphorus diet, supplying 0.3 g. of phosphorus daily.

On April 6th the phosphatase was 14.8 units, which is within the normal range. On April 8th the blood calcium was 9.9 and the blood phosphorus down to 4.7. Chvostek's sign had entirely disappeared. She was carried along on this diet until April 17th, and then put on a ward diet.

April 17th.—Blood calcium 9.9 and phosphorus 4.7.
April 21st.—Blood calcium 9.9 and phosphorus 3.8.
April 24th.—Blood calcium 9.5 and phosphorus 5.9.
May 1st. —Blood calcium 9.6 and phosphorus 6.4.

The above figures show a rising blood phosphorus on an ordinary diet.

From April 25th, while on this diet, 24-hour specimens of urine were collected for five days. Analysis showed that the average daily excretion of calcium was 33 mg. and phosphorus, 331 mg. The calcium excretion was extremely low. Even on low calcium diets the daily excretion of calcium in the urine did not fall below 30 or 40 mg.

On May 1st the child was placed on a weighed diet which furnished 100 mg. of calcium daily and 1 gram of phosphorus. Twenty-four hour specimens were again collected for four days. Analysis showed the excretion of calcium to be 17 mg. and phosphorus 503 mg. These figures coincide with the work done by J. C. Aub and co-workers,[3] namely, that the urinary excretion of calcium in normal persons restricted to a diet containing about 0.10 grams of calcium was on an average 0.19 grams for a 3-day period; whereas in patients suffering from parathyroid hypofunction the calcium excretion of the urine for the same period and on a similar diet was but 0.023 grams, or about one-tenth of the normal.

On April 27th there was a very slight positive Chvostek's sign. On May 5th, the blood calcium was 10 mg. and the phosphorus 5.8 mg. May 19th, blood calcium was 11 mg.; phosphorus 5.8 mg.

During the remainder of stay in the hospital her condition was quite good and on May 21, 1939, she was discharged home on calcium and percomorph oil, as a prophylactic measure to maintain her blood calcium.

The symptoms of the disease may be divided into two headings, (*a*) manifest or acute; (*b*) latent.

In (*a*) the majority of cases follow operation on the thyroid gland and usually occur 2 to 7 days after operation. The symptom usually noted first is numbness and tingling of the lips, nose or hands. An unnatural flexion of the hands, wrists, and elbows soon follows. If one straightens out the hands and arms they will be seen to slowly resume their previous fixed positions. Fine tremors of the face and the muscles of the extremities are seen as the disease progresses. A flushed, apprehensive, facial appearance with a typical circum-oral pallor is often present. Vision and speech may be blurred. When the laryngeal muscles are involved there are marked respiratory stridor and recurrent contracture of the abdominal muscles. Late in the disease the entire body becomes hyperextended in a generalized convulsion; coma and death may result; or the attack may subside, to recur later.

(*b*) The symptoms of latent tetany may be so mild as to be overlooked for a long time. Intermittent contractions, stiffness of the hands, numbness of the face, and paresthesia may be the only clinical manifestations. If of long standing, degenerative changes are noted—dulling of the mental processes, marked trophic changes of the nails and hair, opacity of the eye lenses (cataracts), and gastric ulcer associated with Dupuytren's disease.[2]

Chvostek's sign is present in a large percentage of cases and Trousseau's sign to a lesser extent. The most constant sign is the demonstration of nerve hyperexcitability by use of galvanic stimulation. The demonstration of a lowered blood calcium content and an elevated blood phosphorus with any of the above clinical signs establishes a diagnosis of parathyroid tetany.

The therapeutic goal, whether treating manifest or latent tetany, is to relieve the hypocalcæmia which is usually present and to lower the blood phosphorus. Any treatment that increases this ratio tends to relieve the symptoms. Several forms of treatment have been suggested in the past ten years, such as the administration of large doses of calcium, orally, intramuscularly, or intravenously, vitamin D in the form of viosterol or cod liver oil; the lowering of the blood phosphorus by the use of dextrose, insulin or limiting the phosphorus intake; reducing alkalosis or increasing acidosis; transplanting parathyroid gland or injecting parathyroid extract parenterally. Three cases of tetany were reported cured by pericarotid sympathectomy.[7]

As an emergency treatment in acute cases the use of parathyroid extract and calcium is still the ideal treatment. Parathyroid extract, used alone, will usually fail to give prolonged relief and will even aggravate the tetany. This treatment oftentimes is the direct cause of calcium depletion producing the advanced trophic changes.[6]

The use of calcium salts and parathyroid extract will relieve acute symptoms and temporarily restore the blood calcium to normal. These measures however are not suited to prolonged use because of the transitory rise of the blood calcium and the necessity of repeating the injections at least daily. A tolerance to parathyroid extract is frequently developed, so that increasingly large doses are necessary, and finally little or no effect is obtained.

The usual treatment of this disease is as outlined above, but recently a newer method has been perfected by Prof. F. Holtz, of the University of Berlin. He described a substance called dihydrotachysterol (A. T. 10) in 1933.[8] This drug has certain definite advantages over parathyroid extract in the treatment of chronic tetany. Unfortunately, it should be used only in cases where the calcium content of the serum can be watched.[9] If it is administered too frequently and in too large doses it may lead to a dangerous hypercalcæmia with calcification of the organs, especially of the kidney.

SUMMARY

A case of latent tetany is reported, with a review of the literature.

Treatment with calcium and vitamin D and a low phosphorus diet produced a prompt response in four days.

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THE TREATMENT OF CONVULSIONS WITH DILANTIN SODIUM*

BY WM. A. HAWKE, M.D.(TOR.), M.R.C.P.(LOND.)

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SODIUM diphenyl hydantoinate (dilantin sodium), a white bitter alkaline barbiturate, was first studied by Merritt and Putnam.[1, 2] Their first papers dealt with its anticonvulsive properties and its low toxicity in experimental animals. Their later papers dealt with the treatment of a large series of epileptics whose convulsions were inadequately controlled by any previous forms of anticonvulsive therapy. Their results were most encouraging. In cases with predominant grand mal convulsions approximately 55 per cent had cessation of attacks and 85 per cent were improved; in cases with predominant petit mal convulsions approximately 35 per cent had cessation of attacks, and 85 per cent were improved. In about 20 per cent of their cases, however, toxic reactions occurred, rashes, diplopias, visual disturbances, ataxias and tremors.

This present report embraces a small series of 25 cases which have been under treatment for six months. These patients were taken from the Out-patient Department of the Hospital for Sick Children, Toronto, but are not comparable to the series reported by Putnam, since a number of these children had been fairly well controlled by previous forms of therapy. The convulsions were of varied origin. In four children they were due to cerebral agenesis, in two to cerebral birth injuries, in one to encephalitis, in one to cerebrospinal lues, and in 17 they were idiopathic in origin. The intelligence quotients of this group varied from 49 to 111, with an average of 77. Sex incidence was almost equal; 12 children were male and 13 female. The ages of this group were as follows: under four years, 1 child; between four and eight years, 6 children; between eight and twelve years, 11 children; and over twelve years, 7 children.

The drug was given in 0.1, 0.05 and 0.03 gram capsules, approximately 1½ grains, ¾ grain and ½ grain. The usual dosage employed was 0.1 gram with meals, three times a day for children over six, and 0.05 gram three times a day for children under six. The earlier cases were immediately placed upon the full dosage of the drug, but as this therapy produced many toxic reactions the later cases were placed upon

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From the Department of Pædiatrics, University of Toronto, and the Hospital for Sick Children, under the direction of Alan Brown, M.D., F.R.C.P.(C.).

a graduated dosage and showed fewer reactions. In children under six a 0.03 gram capsule was given on the first day, and on alternate days another capsule was added until the child was taking two 0.03 gram or one 0.05 gram capsule three times a day. Older children began with a 0.05 gram capsule and were increased in a similar manner to a 0.1 gram capsule three times a day.

The previous medication, usually phenobarbital or bromides, was continued during the first month of dilantin sodium therapy but was stopped at the end of that time. About 50 per cent of the children were given nothing but dilantin sodium for the next five months, but in some of the refractory cases small doses of phenobarbital were added to the drug at varying intervals of time. It is possible that the dosage of dilantin sodium given in this series is not adequate for all children, and in the future larger doses will be given to the refractory cases.

Results.—The results obtained were not so satisfactory as those described by Merritt and Putnam.[2] An attempt was made to divide the cases into two groups—those in which convulsions of the grand mal type were predominant and those in which convulsions of the petit mal type were predominant. This division proved difficult, and the cases were divided into four groups: (*a*) those in which the grand mal type were definitely predominant; (*b*) those in which the petit mal type were definitely predominant; (*c*) those in which these two types were combined without definite predominance; and (*d*) an intermediate group in which the patient had loss of consciousness and clonic movements of a localized group of muscles, but not generalized convulsive movements.

The following results were obtained.

TABLE I.

Results obtained	*Dilantin therapy*		*Previous therapy*	
Controlled	18	72%	10	40%
Not controlled ...	7	28%	15	60%

From this Table it is seen that dilantin sodium alone or in combination with phenobarbital was able to control 72 per cent of our patients, as compared with 40 per cent controlled by previous forms of therapy. There is thus an increased efficiency in 32 per cent of the cases.

The best results were obtained in those cases showing some evidence of localized or generalized clonic movements, and 75 to 90 per cent of these cases were controlled by dilantin sodium as compared with 40 to 50 per cent controlled by previous forms of therapy. In the cases of petit mal however the results were less satisfactory, only 42 per cent being controlled by dilantin sodium as compared with 28 per cent controlled by previous forms of therapy,

TABLE II.

Results obtained	*Grand mal type*		*Combined type*	
Controlled	9	90%	3	75%
Not controlled ...	1	10%	1	25%
	Petit mal type		*Localized type*	
Controlled	3	42%	3	75%
Not controlled ...	4	58%	1	25%

an improvement of 14 per cent. It is probable that the figures given in this paper will be altered by further observation as some of the controlled cases may relapse and some of the refractory cases may be benefited by larger doses of the drug.

Dramatic results were obtained in several children.

CASE 1

A twelve year old girl had had predominant grand mal convulsions since infancy. She was admitted to hospital in status epilepticus and was treated by sodium phenobarbital. This was unsuccessful, but the attacks were immediately controlled by dilantin sodium. She was then discharged upon phenobarbital, but returned in five days in another status epilepticus. This was rapidly controlled by dilantin sodium and she was discharged upon this drug. She has had no further convulsions as long as the drug is administered in adequate dosage. It has been dropped below this level on three occasions with a temporary return of convulsions.

CASE 2

A fourteen year old boy had had grand mal convulsions for five years. The attacks were increasing in frequency and he was admitted to hospital because of marked changes in personality. He was confused, irritable, and talkative, refused to get out of bed, would not eat, and was incontinent of urine and fæces. The administration of dilantin sodium promptly stopped the seizures and produced a marked improvement in behaviour. The boy has now been free from attacks for many months and presents no problems of behaviour.

Reactions.—As indicated in Table III, the following reactions have been noted.

TABLE III.

	No. of cases	*Percentage of total cases*
Rash, morbilliform or scarlatiniform	3	12
Ataxia, staggering gait, or visual difficulties	3	12
Combination of the above reactions	2	8
	8	32

In addition to these reactions one patient complained of a sore mouth and showed definite hypertrophy of the gums. All cases are now being checked for this hypertrophy and because of the suggestion of Kimball[3] that the hypertrophy may be a scorbutic type of reaction the blood ascorbic acid is being done on all children receiving the drug. There were no mental disturbances amongst this group similar to those psychic disturbances reported as complicating dilantin sodium therapy in adults. Gastro-intestinal complaints were not marked and nausea was not a common complaint if the drug was taken with meals.

When a reaction was noticed the drug was stopped until the rash or ataxia cleared up; at the end of that time it was started again, using the graduated type of dosage. By this means all the children with one exception were eventually able to tolerate the drug. In this child any dose approximating the maintenance dosage was accompanied by a severe skin reaction.

CONCLUSIONS

1. This is a preliminary report on 25 children with convulsions who have been treated by dilantin sodium.

2. The results obtained in this series are for a period of six months only and may be altered by further observation and by the use of larger doses of the drug.

3. The dosage used was 0.1 g. three times a day for children over six and 0.05 g. three times a day for children under six. In some of the more refractory cases small doses of phenobarbital were added to the drug at varying intervals.

4. The results seem to indicate that the drug is of value in the treatment of children with convulsions of the grand mal type and has produced spectacular results in a few cases.

5. The drug appears however to be of less value in the treatment of children with convulsions of the petit mal type.

6. Toxic reactions are common in children (36 per cent of our series). No severe reactions were encountered, and only one child was unable to tolerate the drug.

7. In children fewer reactions will occur if the drug is administered in a gradually increasing dosage.

We should like to thank the Parke Davis Company, of Walkerville, Ont., for their generous supply of this drug.

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APPENDIX VERMIFORMIS DUPLEX

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THE question of whether or not two vermiform appendices can exist in one person can be definitely answered in the affirmative. Three specimens, one in Boston, one in London, and one described from Glasgow, furnish proof positive. Henry N. Pratt[1] has the abdominal organs recovered from a child who died on the 15th day from a condition not associated with cæcum or appendix. In this specimen is to be seen a cæcum not of the ordinary type, but one in which it appears to be a direct continuation without enlargement of the small gut, and from each side of this cæcum is to be seen arising a vermiform appendix. These appendices have a lumen that is continuous with the lumen of the cæcum and the structure of the muscle coats; lymphoid tissue and mucous membrane are identical with those of an ordinary appendix. Aitkens[2] found a case that had double cæca and each had a vermiform appendix. A. J. E. Cave[3] describes the condition and gives an excellent short dissertation on the subject.

Descriptions of operations where double appendices were found are also on record. While these descriptions of clinical cases are not of themselves proof that the condition exists, still when such descriptions are given by well trained and reputable surgeons one may well add their weight to the sum of evidence. The lay press repeatedly reports the finding of two appendices at operation, but very few cases have found their way into medical literature.

Berthold[4] relates the occurrence of a double appendix. While operating upon a woman, sixty

years of age, for a strangulation of the ileus, the result of a previous operation upon the pelvic organs, he investigated the cæcum. "Two appendices were found, one 7 cm. long in the normal site, namely, continuous with the tænia libera; the other 5 cm. long 2 to 3 cm. laterally, growing from the haustrum. The former seemed to be slightly inflamed and thickened. Both were removed in the typical manner". Histologically, neither of the appendices showed inflammatory changes; both showed the histological structures common to the appendix.

L. Schooler[5] reports operating upon a woman 23 years of age who had an intestinal obstruction and a general peritonitis. "On opening the abdomen there escaped a quantity of pus, and the intestines presented with a normal appendix in front. This was clamped near the base and was found to be attached to the free surface of the colon. On introducing my finger I discovered another appendix about one inch below the base of the first, greatly swollen, and perforated near the middle. The distal extremity was gangrenous. The diseased one was ligated and removed. The bowels were found completely obstructed by the exudate. The obstructed portions were released and attention given to the normal appendix. This was removed in the usual way. After removal it was carefully examined, and measured 4 inches in length. It was normal in every respect, except possibly it may have been slightly smaller in its diameter than its fellow. But on account of the swollen condition of the perforated one this could not be determined."

W. G. Young[6] reports two appendices in one person. A young woman 21 years of age had abdominal pain and vomiting for three days. The diagnosis of acute suppurative appendicitis with peritonitis was made and operation advised. "On opening the abdomen I found pus in the peritoneal cavity with no walling off. There were two appendices containing pus; one was ruptured. One appendix measured 3 x ⅜ inches, the other 3½ x ⅜ inches. The bases were 1¼ inches apart and each had a meso-appendix."

Dr. Joseph Boulanger, of Edmonton, Alta., on April 19, 1936, operated upon a boy who had an acute suppurative appendicitis. He found two appendices which were separated at the base by about 2 inches. They were described by the pathologist as follows: "(1) Portion of appendix 7.5 cm. in length and 7 cm. in diameter showing clamp marks at base and what appears to be the tip. There is a sharp kink near the base and the whole structure is acutely inflamed throughout. (2) Portion of appendix 5 cm. in length and 5 cm. in diameter. A clamp mark is noted at the base of the specimen and a clamp mark and suture is present at the tip. Sections of (1) show infiltration of walls by myriads of polymorphonuclears, leukocytes and diffuse necrosis and œdema. Sections of (2) show structure of appendix, but no evidence of inflammation."

In addition to these cases reported of instances where surgeons have found at operation two appendices from one cæcum cases are described where there have been two bases with a tip that is fused (A. Elwyn[7]). There have been cases where there has been one base with bifid tip (Clavel and Colson[8]). There have been cases where the appendix on section has been found to have a double lumen (Rosenberger[9] and Prentiss[10]).

Morphologically there is no reason why the human being might not have two appendices. A duplication is said to be possible in any part of the gastro-intestinal tract. The cæcum is formed by a pouching of the primitive loop. The apex of this pouch forms the appendix. In birds there are double cæca. But apart from the higher apes and the wombat no other animal but the human has the type of vermiform appendix. Cave[3] explains its occurrence embryologically by referring to the work of Kelly and Hurdon[11] and Gladstone and Wakeley.[12] A transient appendix develops from the tip of the cæcum at the beginning of the 5th week, and, atrophying at the 7th it soon afterwards has completely disappeared. The normal vermiform appendix differentiates later. Cave suggests that the transient appendix may be substantiation of an ancestral cæcal duplicity in the mammalia.

Appendix duplex has a real medico-legal significance, as was demonstrated in a case in the Canadian courts in 1935.[13]

May I suggest that many surgeons have heard of people who have been operated upon the second time and an appendix found that was supposed to have been removed at a previous operation when a subacute appendicitis was the object of the operation, and the operators had simply ignored the possibility of a second ap-

pendix. Do surgeons search when taking out a subacute appendix to make sure there is not another appendix present? When any surgeon finds a case of this rare anatomical occurrence he should record it in the literature. How many surgeons who read this have had the experience of operating on an abdomen and, having found the cæcum, have been unable to find a vermiform appendix? Cave[3] points out the fact that there may be a congenital absence of the appendix. Such a finding should also be recorded.

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THE PATHOLOGY OF THE DISSECTING ROOM*

BY C. R. SALSBURY

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IT is universally recognized that post-mortem examinations have contributed much toward the present high plane of medical science. In spite of the increasing part played by chemical research and animal experiment the human body, living or dead, must always remain our ultimate court of appeal. Much has been written and done to increase the percentage of post mortems performed in modern hospitals, but one great potential source of scientific information has been largely unused.

Several generations have been accustomed to the pathology of the morgue, and in the past two decades the pathology of the living has been accorded its proper high place. But there is a broad field still uncultivated. I refer to the anatomy department. Several thousand bodies are dissected each year in the medical and dental schools of North America, but, apart from the purely structural or developmental, little or nothing is gained from them. The routine autopsy of the pathology department comprises an examination of the thoracic and abdominal viscera, sometimes of the brain, rarely of the spinal cord. These incomplete investigations probably represent the best compromise at present possible between science on the one hand and humanity on the other. Any attempt to increase their scope might well defeat its purpose and increase the difficulties of obtaining permission for examination.

But what of the bones and joints, the thyroid and parathyroids, the autonomic system, and many other parts seldom seen by the pathologist? Is it merely coincidence that diseases of these structures have been among the last to be elucidated? The physiology of the autonomic system is now on a firm foundation, thanks to animal experiment, but do we know anything of the causes of its derangements?

I cannot believe that tumours of the parathyroids were unnoticed by anatomists for three hundred years. Had they known the history of bone pains, multiple fractures, etc., the clinical entity of hyperparathyroidism might well have been recognized generations earlier. Is it not reasonably certain that prolapse of the nucleus pulposus has been observed since the earliest days of anatomical science? What human misery might have been spared had the history of intractable sciatica accompanied some of these bodies! The number of operations performed on the inferior cervical or first thoracic ganglion of the thoracolumbar autonomic chain is ample evidence of interest in these structures as a possible origin of disturbances of the heart, bronchi or upper extremity. Yet we have found enlargement of one of these ganglia, often meriting the name "tumour", in at least 5 per cent of bodies. In the absence of clinical records we

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do not know if they were associated with disturbed function, much less if they caused it.

This article is intended as a plea for the co-operation necessary to prevent this needless waste of valuable scientific material. Would the pathologist willingly conduct an autopsy if he were deprived of all knowledge of the previous history, or would the clinician attach much value to such an examination if he were left in ignorance of the result? Such conditions will appear unthinkable, yet this is an accurate picture of the present status of the morbid anatomy revealed in the dissecting room. The anatomist knows nothing of the history, and the clinician learns nothing of the findings. It is suggested that a clinical record should accompany all bodies consigned to the schools; in return for this courtesy, a full report could be sent, eventually, to the physician or hospital concerned. I believe that all anatomy departments would be pleased to assume this small duty in return for the co-operation of the clinician.

I have had this matter under consideration for several years, but, fearing that my dual interests might have produced a biased point of view, have hesitated to give it publicity. Since Murray's[1] recent article shows that he, also, has recognized its possibilities, I have been encouraged to present it to the profession.

Let us investigate the possible value of such a scheme.

To the Physician and Hospital:

(*a*) The report, when finally received, would complete the clinical record and make it more valuable for future reference or statistical research.

(*b*) The conscientious clinician will be pleased to receive confirmation of his diagnosis and stimulated to further study when post-mortem examination proves his clinical deductions in error. This second factor is of wider application than may be considered, as witness the following from our recent records.

1. Diagnosis: acute alcoholism; findings: large, localized, clotted but not organized subdural hæmatoma.

2. Diagnosis: fractured skull; findings: fracture of skull without visible brain damage, fracture of ilium, fracture of 8th, 9th, 10th and 11th left ribs, and, *apparent cause of death,* ruptured spleen.

3. Diagnosis: arteriosclerosis and general debility; findings: dissecting aneurysm of descending aorta, right hæmothorax, fractured right 6th and 7th ribs.

4. Diagnosis: influenzal pneumonia; findings: tuberculosis of lungs, ileum and larynx.

5. Diagnosis: cancer; findings: a recent, unhealed, abdominal incision, general peritonitis of sufficient duration to form firm but incompletely organized adhesions, a 2½ inch tear in the lesser curvature of the stomach with its edges adherent to the inferior surface of the liver.

To the Anatomy Department:

(*a*) Even the most junior student of medicine is profoundly interested in disease. Under the present curriculum his first contact is in the anatomy laboratory and one of his earliest queries concerns the cause of death of the subject assigned to him. On finding some abnormality, he almost invariably asks if it were a factor in the fatal illness or produced symptoms. If a summary of the pertinent clinical history could be given to each student, he would be encouraged to look for and note any evidence of disease, thereby receiving valuable training in observation and awakening a spirit of clinical research.

(*b*) The teaching staff, as well as the student, could scarcely fail to be stimulated and interested.

To Medical Research:

(*a*) The addition of these very complete post-mortem reports to hospital or private records.

(*b*) The gradual acquisition by the anatomy departments of a series of clinical and pathological records.

(*c*) A clinical background against which the department staff might assess the significance of abnormalities found during the course of dissection. We have observed an apparently unrecorded characteristic by which certain cases of chronic arthritis differ from others. Should the clinical records of these show some common deviation from type our at present valueless observation might acquire significance. This is by no means the only lesion in which we have been interested, and the same is doubtless true of all anatomy departments.

Before such a scheme could be put into practice, certain minimum requirements must be fulfilled.

1. Physicians and hospital managements must be willing (or induced) to submit the necessary clinical records.

2. Anatomy department staff members must be sufficiently interested to note and record abnormal findings.

3. Teachers of anatomy must possess some knowledge of pathology. This may be relied upon, to some extent, except in those cases, not rare in the United States, where the teachers of anatomy have no medical training. The knowledge might be far from expert, at the beginning, but would increase with observation and reading and the records would become increasingly valuable.

It is true that inability to obtain satisfactory microscopic preparations of embalmed material would rob it of some value. Perhaps a satisfactory histological technique might be developed, and only the presence of early post-mortem changes remain to hinder the examiner.

Suggestions for the organization of such a co-operation between physicians, hospitals and departments of anatomy are scarcely within the scope of this somewhat exploratory paper.

SUMMARY

I have called attention to the fact that the wealth of pathological material observed in the dissecting rooms, much of it such as is not often observed by routine autopsy methods is at present largely wasted. Suggestions are offered for its more efficient utilization.

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A NOTE ON HISTAMINASE

BY C. H. BEST AND E. W. MCHENRY

Department of Physiological Hygiene, University of Toronto, Toronto

A RECENT communication to the *Journal of the American Medical Association* by Keeney on the treatment of hay fever by the oral administration of histaminase may possibly convey the impression that we have been in part responsible for the clinical use of this enzyme. The same impression could be secured from other reports and from the advertising material of the Winthrop Chemical Company.

In a review on histamine published by us in 1931 work on histaminase was summarized, and it was pointed out that the presence of the enzyme in various tissues, particularly in the kidney, may constitute one of several defence mechanisms possessed by the body for the inactivation of histamine. It was not suggested, nor has this been done in any subsequent publication, that the administration of histaminase might be a useful mode of therapy.

Investigations in this laboratory in the period 1930-32 showed that the administration of histamine to animals for a period of some weeks has no effect upon the histaminase content of the kidneys. It would be expected that increased need for histaminase would cause an increased production of the enzyme, especially during a prolonged period. A decrease in enzyme content is not observed after a single, large dose of histamine. Protection of guinea pigs against anaphylactic and histamine shocks was attempted, with completely negative results. After the publication of a paper on this subject by Brown and Karady the work was repeated and negative results were again secured.

It was reported in 1930 that histaminase was inactivated in acid solutions. This would suggest that introduction of the enzyme into the stomach would render it inert. We have found, as would be expected, that histaminase is inactivated by pepsin in acid solution and by trypsin in slightly alkaline solution. It would be difficult to suppose that histaminase, given orally, could survive the action of proteolytic enzymes in the gastro-intestinal tract. The suggestion might be made that histaminase, given orally, would inactivate histamine in the intestine, thus preventing the absorption of a toxic amine. It is most unlikely that such would occur, since the enzyme is itself rapidly destroyed by the digestive ferments.

Our investigations, over a period of ten years, have failed to show that the intravenous or intramuscular administration of histaminase has any effect upon histamine present in the body

or on that given by injection. Preparations of histaminase, at least four times as potent as any commercially available, have been used without success. Possibly, very active enzyme preparations might have a demonstrable effect but such are not yet available.

The work on histaminase provided evidence regarding one of several mechanisms possessed by the body for the destruction of histamine. Data regarding the chemical and physical properties of the enzyme system were made available. The results of investigations which we considered to have no obvious practical application have been applied by others to clinical problems. For some years we have consistently answered numerous enquiries about histaminase with the statement that we believed there was no physiological basis on which to rest its clinical use.

Case Reports

PAPILLITIS ASSOCIATED WITH SINUS DISEASE

By S. Hanford McKee

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When Onodi in 1908 described the anatomical relationship between the posterior sinuses and the optic canal he felt that he had definitely established an etiological relationship between disturbances of vision and disease of the posterior sinuses. This relationship was later emphasized by Loeb and, in 1920, by Schaeffer. They all demonstrated that it was not uncommon for the posterior ethmoids, at the posterior external angle of the ethmoid capsule, to encroach on the optic canal, making it abnormally small, a condition which might lead to serious pressure on the nerve with subsequent disease. In 1927 Crane stated that not only was there a likelihood of direct extension of infection from this relationship, but that a simple inflammation of the sinuses was sufficient to cause a disturbance in the nerve. Many different views as regards the method of extension of the infection have been put forward. Leon White in 1928 expressed his belief that the invasion of the optic nerve was always hæmatogenous, and he definitely stated that he had never observed a case, except in instances of malignant disease, where he thought there was direct extension from the sinus to the optic nerve. His theory of negative pressure is well known. In 1934, Lillie, of the Mayo Clinic, stressed the unimportance of sinus infection as the cause of optic nerve lesions. In a report of 225 cases of retrobulbar and optic neuritis there was only one in which the condition was due to sinusitis. Multiple sclerosis was by far the commonest cause in this series. Benedict agreed with this view of the importance of multiple sclerosis. Numerous others have made similar reports, and at the present time multiple sclerosis is believed to be by far the commonest cause. Treacher Collins never concurred in the close relationship of sinus disease and retro-bulbar neuritis, and in 1926, when this theory was much written about, said he had not as yet seen a case in which retro-bulbar neuritis could be attributed to sinus disease.

A.Z., an adult male of 41 years, was seen in the Medical Out-patient Department of the Montreal General Hospital, when he complained of impaired vision in the left eye, and stated that this had begun eight days previously. During the last three days the dimness of vision had increased very markedly. He also stated that he had felt feverish during this period. The patient's physical examination did not reveal much except diminution of vision in the left eye. There was however some slight tenderness over the left antrum and frontal sinus. X-ray examination showed evidence of cloudiness of the right antrum and right frontal sinus. His blood Wassermann was negative.

Examination at the Eye Clinic showed vision of the left eye reduced to perception of light; the right vision was normal. The left optic disc was seen to be inflamed, while the right seemed quite normal. One week later the patient complained of visual disturbance in the right eye to such an extent that he was not able to go about by himself. He also complained of headache and pain over the right frontal region. Examination showed the right disc to be inflamed and swollen. He was referred to the Department of Otolaryngology and admitted to that service. A submucous resection was first done, with no change in the appearance of the right or left disc. Five days later a radical frontal sinus and ethmoidectomy was done with drainage of the sphenoid. The operative findings in the posterior group were scanty, though muco-pus flowed out of the open right sphenoid. The opening was enlarged and the cavity well drained with suction. Four days later, examination revealed a decided improvement in the appearance of the discs. There had been a steady and rapid recession of the œdema and inflammation. His vision had improved very materially.

He was discharged and three weeks later was seen again at the Eye Clinic, when the vision in each eye was 6/12. His vision continued to improve until it became normal. Examination of the fundi showed the discs, vessels and fundi in general normal, except for a possible slight pallor of the discs. The vision in each eye was quite normal.

Editorial

GAS AND GASSING

CHEMICAL warfare came as a surprise in the last Great War and brought with it new problems. At the present time we have not experienced its dangers so far, but we may. It therefore behoves every medical man, and particularly every medical officer at the front, to be conversant with the properties of the more important gases that have been used and may be used again. This would seem to be self-evident. Many articles on the subject have appeared in the British journals and a number of brochures have been issued by H.M. Government in which our present knowledge is detailed. These are worthy of the careful attention of the medical profession, but the brochures are not readily to be obtained and are probably too lengthy except for leisurely perusal. Accordingly, any such material which emanates from reliable sources on this side of the water is also welcome. We have in mind, in particular, an article by Leon Goldman and the late Glenn E. Cullen[1] which has in recent weeks appeared in the *Journal of the American Medical Association*, and can, of course, be more quickly obtained here. And speed counts. One is apt to be lost in the maze of facts that have accumulated, and, therefore, we have ventured to cull the salient features of this paper in the hope that they may be presented in such a form as to be easily remembered. When the emergency of gassing arises there is no time to consult authorities. We must have the requisite knowledge in our heads and instantly available.

During the last war the Chemical Warfare Service of the United States examined about 4,000 substances of which only 54 were tried out in the field. Only 12 were in use at the end of the war. The more important gases, from the point of view of producing casualties were the lung irritants and the vesicants.

The poison gases presently to be considered are:—

1. LACRIMATORS—chloracetophenone, brombenzylcyanide.
2. LUNG IRRITANTS — phosgene, chloropicrin.
3. VESICANTS—mustard gas, lewisite.
4. STERNUTATORS — diphenyl-chlorarsine (sneeze gas).
5. NERVE AND BLOOD-POISONING AGENTS —hydrocyanic acid, carbon monoxide.

Chloracetophenone is a powder smelling like locust. The treatment is boracic acid solution for the eyes and the application of a solution of bicarbonate of soda to the skin.

Brombenzylcyanide is also a powder, smelling like sour fruit A boracic acid lotion should be used.

Phosgene is a colourless gas smelling like mouldy hay. It is very insidious. It produces a choking cough, asphyxia, and pulmonary œdema. The treatment is that for shock—absolute rest, application of heat, and oxygen if pulmonary œdema develops

Chloropicrin is a slightly oily colourless liquid smelling like flypaper. It causes lacrimation and irritation of the lungs. It may be insidious. The eyes should be bathed with boracic acid solution, and in addition the treatment for phosgene gas poisoning should be applied.

Gas masks are a protection against the four agents mentioned above.

Mustard gas is oily and colourless in its pure state, later becoming brown, smelling like mustard or garlic. It causes burns and blisters on the skin. If from the vapour, these are delayed from two to six hours; if from the liquid, from fifteen minutes to one hour. If it is inhaled it produces severe irritation of the lungs. Treatment should be prompt. The victims should be washed with soap and water, gasoline, carbon tetrachloride, or a weak solution of bleaching powder. If the last-mentioned is used it must be washed off the skin as it is an irritant of itself. A gas mask protects only the lung; special clothing is required to protect the skin.

Lewisite is a colourless liquid smelling like geraniums. It first causes sneezing, then

1. GOLDMAN, L. AND THE LATE CULLEN, G. E.: Some medical aspects of chemical warfare agents, *J. Am. M. Ass.*, 1940, **114**: 2200.

burns of the skin, and, later, arsenical poisoning. Immediate treatment is called for with soap and water, pastes of ferric hydrate, general measures. Protection is the same as for mustard gas.

Diphenyl-chlorarsine is a dark brown liquid smelling like shoe polish. It produces coughing, sneezing, vomiting, headache, and, later, mental depression. A solution of bicarbonate of soda should be used as a mouth wash, and also should be instilled into the nose. Early treatment also includes breathing chlorine from a bleaching-powder bottle. Later, rest is essential.

Diphenylamine chlorarsine (adamsite) is an almost odourless solid having a greenish or brownish yellow colour. The symptoms and treatment are the same as for sneeze gas. Protection against both can be afforded by a gas mask, if provided with an excellent filter.

Hydrocyanic acid is a clear colourless liquid, smelling like bitter almonds. It is intensely poisonous. It causes faintness, giddiness, and dryness of the throat, followed by coma and death. Artificial respiration and restoratives may be tried, if the case is promising, but usually death occurs too speedily for any treatment to be of avail.

Carbon monoxide is produced by practically all explosives and is a colourless, odourless gas. It is very insidious and causes blurring of the vision, muscular weakness or paralysis, headache, and coma, followed by death. One characteristic sign of this form of poisoning is a cherry-red colour of the skin, either generalized or in blotches. The treatment consists in removal to fresh air, artificial respiration, and the administration of O and CO_2 (at first 7 per cent of the latter and later 5 per cent). A gas mask with a special canister protects against both hydrocyanic acid and carbon monoxide. These poisonous agents were used in the last Great War, but are not likely to be used again on account of being so easily dispersed.

The authors referred to remark, "There is a vast amount of misinformation on the residual effects of chemical warfare agents. The blame for practically every complaint, respiratory, or otherwise, in veterans has been placed on 'being gassed in the war'. The truth of the matter is that there are relatively few residuals from chemical warfare and certainly not those horrible ones following shrapnel, gunshot wounds and the like." Pension boards might take note of this.

A.G.N.

Editorial Comments

The Late Frederick Gault Finley

Those of us belonging to the earlier generation will have learned of the passing of Dr. F. G. Finley with more than ordinary regret, and particularly if we had had the great privilege of studying clinical medicine under his wise direction. It is not too much to say that he was one of the best teachers the Medical School of McGill University ever had. And his influence lasted. His teaching was clear, logical, and effective; his pupils always remained his friends; we remember his method. To all of us, old and young, his memory should prove an inspiration.

Despite his advanced years, Doctor Finley remained young — young in manner, young in action, young in outlook; he was always courteous, friendly, approachable. Until the last he maintained his interest in medicine, keeping up with its advances, and could frequently be seen at medical gatherings. This, and his wide experience, combined to make him a practitioner and consultant of the best type.

As a member of the Editorial Board of this *Journal* he was assiduous in his attendance and we often profited by his wise counsel.

We shall miss him.

The Late P. Calixte Dagneau

We regret to have to announce the death of Dr. P. C. Dagneau, of Quebec City, one of the Corresponding Members of the Editorial Board of the *Canadian Medical Association Journal*. Doctor Dagneau was an outstanding member of our profession, a master of the English as well as the French language, a man of broad culture and ready sympathies. Few have done so much to expand and cement the good fellowship that, happily, now exists between the medical men of both races in Canada. This is a consummation heartily to be desired, and we feel, too, that under the stress of War and a common danger the French and English members of the medical calling will be still more united in spirit and a common purpose. Dr. Dagneau was an interested member of the Canadian Medical Asso-

ciation and had served on its Council. We would welcome to our ranks more of our French-speaking confrères.

We desire to associate ourselves most heartily with Dr. Sylvio LeBlond in his eulogy of our deceased colleague which appears elsewhere in this issue of the *Journal*.

The British Orthoptic Journal

The subject of orthoptics is developing rapidly. It is not surprising, then, that a new journal devoted to the exposition of this special branch of ophthalmology has appeared, to add, however, to the already interminable list of medical periodicals. This journal first appeared in 1939, but the first number only reached us shortly ago. It is the official organ of the newly founded British Orthoptic Society. The first number begins well. It contains a group of articles largely concerned with the theoretical and technical aspects of orthoptics, and, therefore in this particular will interest more particularly those concerned in applying orthoptic principles to treatment. These articles, however, are counterbalanced by ten others which are of a more general character and contain matter which should be of interest and importance to all ophthalmologists, whether they are or are not directly concerned in orthoptic training. This journal is timely, can justify its appearance, and is attractively produced. It has our best wishes for success. J.N.

The Five-Day Treatment of Syphilis

We are indebted to Dr. Cormia for giving us his views regarding the new five-day treatment of syphilis (p. 184). He speaks of its being a great advance in treatment, but wisely urges the utmost caution in adopting it too hastily. There are disadvantages which must be frankly recognized, and until these can be overcome the method should be used only under special safeguards. This, as is pointed out, is one reason why reports on the work at present should be regarded as premature.

We thoroughly endorse the note of caution sounded by Dr. Cormia. It is our desire to keep our readers fully informed with regard to this and any other advance in medical treatment, but there is little to be gained and a good deal to be lost by describing a technique whose potentialities are still so uncertain. H.E.M.

Corrigendum

Dr. William Thau, of Boston, Mass., desires us to call attention to the fact that a mistake in a date appeared in his paper entitled, "The effects of reducing diet on the eye", which was published in the *Journal*, June issue. On page 553, in the footnote, "1938" should be "1939".

Medical Economics

X.

THE COSTS OF HEALTH SERVICES—(II) THE NATURE AND UTILITY OF THE AVAILABLE STATISTICS

By Hugh H. Wolfenden, F.I.A., F.A.S., F.S.S.

Consulting Actuary and Statistician
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While the medical profession for many years has watched the progress of the incidence of sickness, and has tabulated for its own purposes various percentages and ratios derived from the observation of particular conditions and diseases, it has been the duty of vital statisticians generally, and actuaries in particular, to record and study the large masses of data which are used to analyze the "rates of sickness" in the form required for any detailed estimation of the costs of illness. With the object of satisfying the requirements of unbiassed selection, adequacy, homogeneity, and consistency, and the use of defensible assumptions, proper mathematical procedures, and sound inferences, a special branch of actuarial mathematics has been developed over the past 175 years, and now embraces the whole technique by which such calculations can be performed.

Available Tabulations of the Rates of Sickness

Much more space than is available here would be absorbed by any complete description of the tabulations of the rates of sickness which have been compiled by competent actuaries in many countries, with due regard to their variation by (1) age; (2) sex; (3) domicile (urban or rural); (4) occupation; (5) economic status (*e.g.*, income level); and (6) marital condition. These tabulations have also, of course, been made with allowance for the essential distinction between the rates of sickness which are, in reality, prevalent in the lives under observation, and the rates of claim for sickness benefits in respect of such sicknesses when either benefits in cash or in kind can be obtained. This distinction is, indeed, so marked that great emphasis must be laid on the extent to which the rates of claim for sickness benefits depend upon those intangible factors resulting from the ethical and psychological outlook of the individual, as well as on the administrative features enumerated in article No. IV of this series, namely, the "qualifying period",

"waiting period", "benefit period", "periods of attack", "re-qualifying period", character of benefits, and type of organization. Without discussing here either these differential factors as they affect the rates of sickness, or the tabulated rates themselves, it may be well to state that the data now available comprise the following: (i) A long series of statistics from the Friendly Societies' experiences in Great Britain, published by A. G. Finlaison, Ratcliffe, Neison, and Sutton; (ii) A. W. (later Sir Alfred) Watson's Sickness and Mortality Experience of the Manchester Unity of Oddfellows; (iii) the Sickness and Disablement Experience of the 1921-23 Sample under the National Health Insurance Acts, Great Britain; (iv) the Report of the British Government Actuary on the Sickness and Disablement Experience of a Group of Approved Societies for 1921-27; (v) numerous valuable subsidiary tables published in the *Journal of the Institute of Actuaries*, in the Report for 1912-13 on the Administration in England of the National Health Insurance Act, and in the periodical Valuation Reports of the Approved Societies since the advent of that legislation; (vi) various experiences in other parts of the British Empire—particularly in Australia and New Zealand—and certain available tabulations of fraternal society sickness rates in Canada; (vii) important analyses and modifications of the Manchester Unity tables which have been employed widely, and checked extensively, as a basis for group sickness insurance in the United States and Canada, and other statistics founded on North American experience; and (viii) several tables based on the data of European sickness insurance funds. In these experiences the tabulated "rates of sickness" represent, for the various ages, sexes, occupations, and so forth, the number of weeks of sickness per person per annum in each year of age, based on the corresponding years of life "exposed to risk" of sickness in the group observed, with adjustments for those who enter or leave the group during the period of observation. The rates thus calculated satisfy the statistical requirements already explained, and therefore may be used with confidence so long as proper weights are given to any estimated differences in constitution between the communities from which they were obtained and the groups to which they are to be applied.

The Rates of Sickness to be Anticipated in a Given Population Group

The assignment of these weights to give effect to such estimated differences is an actuarial problem of importance. Before the inauguration of any widespread plan it is evidently essential, first of all, to classify the population for which estimates are required according to age, sex, domicile (urban or rural), occupation, economic status, and marital condition, and then to select for each homogeneous subdivision an appropriate rate of sickness which will take into account the qualifying, waiting, and benefit periods, etc., and the methods of administration and control. In this *Journal* it is not necessary to illustrate the statement that rates of sickness exhibit sharp variations at the different ages, for the two sexes, in various occupations, by marital condition, and according to economic status. It may, however, be advisable to note that the determination of an estimated rate for each homogeneous subdivision requires the exercise of experience and judgment. Selection from the mass of available statistics must not be made without very careful thought. It would not be sufficient, for example—as was done in the case of the original non-actuarial estimates for the British Columbia and Alberta health insurance schemes—simply to employ a conglomerate rate of sickness founded on an obscure Austrian experience or a composite European table, with no regard for occupation or marital condition, and with inaccurate allowances for benefit and waiting periods. The average days of sickness per annum thus approximated between ages 16 and 70, and for a waiting period of 3 days and a benefit period of 26 weeks, were given as 7.67 for men and 8.66 for women (including confinements) by the original British Columbia Commission; an independent and complete actuarial investigation, however, showed the figures to be 11.1 for males and 12.1 for females. These more closely reasoned estimates are respectively 45% and 40% greater than the original approximations, and are stated here as a warning against the use of rough and ready methods in situations of obviously great importance.

The Effects of Changes in the Benefit Formula

The estimated average days of sickness per annum for males and females quoted in the preceding paragraph—namely, 11.1 and 12.1—relate to a known population, at ages from 16 to 70, with due regard for its occupational and economic characteristics, and on the assumption of the benefit limitations and procedures imposed by a 3-day waiting period, a 26-week period for benefits, and the administrative methods specified by a particular form of governmental health insurance scheme. As illustrations of the differences entailed by varying these limitations, the average days of sickness for men in the same population, and with the same 26-week benefit period, would be 10.9, 10.7, 10.5, or 10.3 with a 4, 5, 6, or 7-day waiting period, and correspondingly 11.8, 11.5, 11.3, or 11.0 for women. Or, with an illustrative 4-day waiting period, the average days of sickness for men, with benefit periods of 10, 13, 15, 20, 26, or 30 weeks, would be 7.0, 7.9, 8.4, 9.6, 10.9, or 11.6 respectively, and the comparable days for women would be 8.4, 9.1, 9.7, 10.7, 11.8, or 12.5. These statistics, which are calculated accurately, demonstrate how wide may be the variations in the amounts of sickness to be brought under the administration of a plan—the increase occasioned by curtailment of the waiting period from 7 to 4 days being about

6% for men and 7% for women, and by extension of the benefit period from 10 weeks to 30 weeks being 66% for men and 50% for women. The problem obviously is not solved, therefore, by the over-simplified assumption which is quoted frequently—sometimes appropriately, but more often loosely—that the extent of illness may be assumed to lie in the neighbourhood of 8 or 9 days per annum for each person, male or female.

THE ESTIMATION OF COSTS—CLASSIFICATION BY DISEASE CATEGORIES

After these expected days of sickness have been computed, the expenditures resulting from their treatment may be estimated by several methods. The bases of remuneration to be assumed for those who would be called upon to render services will evidently affect the ultimate conclusion very markedly.

Firstly, if it is to be supposed that the physicians, nurses, druggists, and others will continue to be paid either on the present or modified fee schedules, the method might be to determine, for each person to be treated, and for each disease category, the number of visits to the general practitioner, and the fees involved, and similarly the amounts of service required per annum by each person, and the costs entailed, from the surgeon, specialist, anæsthetist, pathologist, radiologist, hospital, nurses, and druggist. This has been attempted in several publications—notably in those of the Committee on the Costs of Medical Care, "The Fundamentals of Good Medical Care" by Drs. Lee and Jones (1933), "The Cost of Adequate Medical Care" by Dr. Samuel Bradbury (1937), and "The Estimated Cost of Medical Care" by the Bureau of Medical Economics of the American Medical Association (1939). These studies are important more for the light they shed upon the estimated *distributions* of the costs involved, than for any infallible guidance in respect of actual expenditures.

Bradbury's estimate, which was based on the standards suggested in the Lee-Jones study, leads him to the high total cost of $63.53 per person per annum, for the complete care of defects and diseases (excluding dentistry), on the minimum fees of the Chicago Medical Society, and on comparable assumptions for hospitalization, nursing, laboratory, x-ray, physiotherapy, and glasses. If nervous and mental diseases requiring long hospitalization, and refractions, be excluded, all the services of general practitioners, specialists, and surgeons represent about $26.33 of this total figure; and the complete $63.53 is divided thus—general practitioners 20.6%, specialists 10.9%, operations 13.6%, extra physician services 1.3% (making all physicians' services 46.4%); hospital services 8.7% (being 4.2% medical, 3.2% surgical, and 1.3% obstetrical); institutional services for nervous and mental cases 9.0%, and for tuberculosis 2.2%; nursing services 12.2%; x-ray and physiotherapy 10.0%; laboratory 8.8%; and eyeglasses 2.7%. In this distribution, the proportion assignable to total physicians' services of 46.4% is probably one of the most soundly based. It may be noted also that Dr. Bradbury found, according to the Lee-Jones standards of adequacy, that preventive services (namely, strictly individualized periodical health examinations, with x-ray, laboratory tests, and immunizations, but excluding dental services and all community health measures) would consume one-third of all the working time of general practitioners, and would involve a cost of $12.22 per person per annum, or 16.1% of his final costs of $75.75 (being $12.22 for preventive care and $63.53 for diagnosis and treatment).

The compilation of the American Medical Association was founded on data concerning the incidence of illness assembled by the United States Public Health Service, and the fee schedules of 559 county medical societies. It produced the smaller figure of $15.83 per person per annum in respect of total physicians' services for which the Bradbury study gave $26.33 (see also W. A. Milliman's paper on "Insurance of the Expense of Medical Service"—Transactions of the Actuarial Society of America, XLI, May, 1940—for further comparisons). The difference is attributable mainly to variations in the assumed frequencies of certain diseases, and lower costs for operations.

Both of these publications, as will appear below, suggest total costs far beyond those which are being shown by the actual experiences of existing plans. They are recorded, nevertheless, as two interesting examples of the ease with which divergent estimates have been reached by changing the assumptions in the basis of approach.

THE ESTIMATION OF COSTS—BASED ON ALL SICKNESSES

The elaborate subdivision of the costs according to disease categories which forms the basis of the preceding estimates can be simplified by dealing only with the figures in respect of all diseases. Although this may introduce some heterogeneity, it is doubtful whether the resulting degree of uncertainty is any more serious than that arising from the attempt to determine figures for the many small subdivisions required by a classification according to disease. In order to deal at one time with the statistics for all sicknesses, it would be necessary to estimate, for each person per annum, the average number of visits to the doctor, his average fee, the similar visits and fees to the specialist and surgeon, the frequency and cost of confinements, and the number and cost of x-ray, laboratory, and other services. Numerous tabulations on these matters are available. As an example of the method Milliman shows, in his paper previously mentioned, a computation which results—after assuming that one-half of the visits to the general practitioner would be eliminated by a deductible sum of $10.00 per illness—in a cost per person per annum of $4.11 (including confinements) for general practitioners' services, $2.50 for specialists, and $3.25 for surgery, or a total of $9.86 for

all physicians' services, to which he adds 50c for the anæsthetist and $1.50 for x-ray and pathology. Other estimates of the same kind have been made on various occasions both in the United States and Canada. The costs of hospitalization have similarly been investigated closely—particularly in the report on "Group Hospitalization" by the Committee on Group Hospitalization of the Canadian Medical Association, and a paper by G. W. Fitzhugh in the Record of the American Institute of Actuaries, XXIII, 311, entitled "Group Hospitalization Benefits". These studies indicate that, depending on the group observed and the facilities available, an average from half a day to one day of hospitalization per person per annum may be anticipated.

THE ESTIMATION OF COSTS—BASED ON ASSUMED SALARIES

Another method of setting forth anticipated expenditures for health services has been employed in respect of hospitalization costs by the British Columbia Government's investigations, and for both physicians' and hospital costs by the Alberta Commission. The anticipated rates of sickness were first selected, and the total days of sickness for the population to be treated were then found. It was thus assumed, for example, under one of the Alberta plans, with a total population of 731,605, that 5,378,744 days of sickness would occur each year, or 7.35 days per person per annum. In order to translate this into the physicians' costs, the Commission stated that the number of doctors and surgeons practicing in the Province—one to each 1,370 persons—was "about adequate to meet the requirements of the Province"; then "what was considered a fair average annual gross cash income for the various types of medical and surgical services available in the Province was estimated"; next "this sum was multiplied by the number engaged in each type of service" (with deduction of Workmen's Compensation Board expenditures); and the result, being $3,178,000, was finally divided by the estimated 5,378,744 days of sickness, giving 59c per diem of sickness, or $4.34 per person per annum, as the contribution required from each individual to provide the doctors' earnings. This method, however, imposes an arbitrarily fixed income upon those who are to render the services. If, for instance, the assumed 7.35 average days of sickness per person per annum were an understatement, and should in fact be 11.5, the doctors' arbitrarily fixed remuneration of $3,178,000 in such an estimate, representing $4.34 per annum for each of the 731,605 persons involved, would remain unchanged, and the only variation in the figures would be that the theoretical per diem cost of sickness would now appear as 37.7c instead of 59c. In other words, the rates and amount of sickness to be treated have no effect upon either the individual's contribution or the doctor's income, both of which are fixed in advance in the computation by the simple process of stating arbitrarily how much every doctor's income shall be, and then dividing by the number of people to be served.

THE FEE-FOR-SERVICE VERSUS THE SALARY MODE OF ESTIMATION

From the preceding paragraphs it will be clear that the *a priori* estimation of the costs of health services must involve either the assumption of the existing or some modified fee-for-service basis, or the arbitrary predetermination of a fixed income level for the doctors and others who are to render services. The former method supposes that some fee-for-service schedule is ultimately fair to the doctor and the patient, and evidently preserves the stimulus of personal initiative. The latter in effect reduces any plan to a salary system, with power to fix the incomes of the doctors in advance. Yet it must be remembered also that any fee-for-service schedule in reality is predicated on the supposition that it will produce a reasonable earning power, and that it makes at least some allowance for uncollectable accounts which might not be a problem with a salary or capitation method. These are the considerations which have produced so great a part of the dilemma in which all of the professions are immersed—in which, indeed, our whole economic system is involved—the conflict between, firstly, the right of the buyer and the seller to negotiate their own price by agreement, and, secondly, the imposition of an arbitrarily controlled economy of abrogated liberties, regimentation, and fixed prices.

THE PRACTICAL COST FIGURES OF EXISTING PLANS

All these methods of *a priori* estimation suffer from the difficulty of settling in advance what a fee schedule ought to be, and from the transformations in present methods which would be entailed by any supposition that doctors and other professional workers might be remunerated on either an assumed or actual salary basis. They do, however, after all the essential reservations have been made, provide a very general indication of the theoretical cost levels which might be encountered in the provision of the "best possible health services—both preventive and curative—for all the people, at a price which is fair to all the people, including those who render the services". While the figures reached by Dr. Bradbury unquestionably raise doubts concerning the ability of all the people to pay on any such scale, they nevertheless are valuable for the light they throw upon cost distributions by disease, and thus may be useful in estimating the proportions of total services which would be included or excluded by the regulations of specific plans. The other methods also, despite their limitations and the criticisms noted, are useful as indications of the relative practicable levels of contributions and resulting income. It then remains to test these estimated costs against the

practical experiences of the many plans which have now been operating for some years.

It is not necessary here to attempt even to give a list of those experiments. A very extensive literature may be consulted—especially pp. 36-38 and 89-101 of the author's "The Real Meaning of Social Insurance" (Macmillan Company, Toronto, 1932); Pierce Williams' "The Purchase of Medical Care through Fixed Periodic Payment" (National Bureau of Economic Research, New York, 1932); Evans Clark's "How to Budget Health; Guilds for Doctors and Patients" (Twentieth Century Fund, New York, 1933); Dr. A. C. Christie's "Economic Problems of Medicine" (Macmillan Company, New York, 1935); M. M. Davis' "New Plans of Medical Service; Examples of Organized Local Plans of Providing or Paying for Medical Services in the United States" (Julius Rosenwald Fund, Chicago, 1936); L. Brown's "Group Purchase of Medical Care by Industrial Employees" (Department of Economics and Social Institutions, Princeton University, 1938); the American Medical Association's "Organized Payments for Medical Services" (1939); and the bibliographies given in those publications. The periodical information concerning the progress of the several voluntary Canadian plans — the "check-off" system in the mining industry of Nova Scotia and Cape Breton; Associated Medical Services, Windsor Medical Services, and the Hollinger Employees' Medical Services Association in Ontario; the Firefighters' Medical Service in Winnipeg, and the Manitoba Hospital Service Association; the Associations in Saskatchewan; and the proposed Medical Services Association in Vancouver—also constitutes an important and practical body of evidence covering the statistical and financial results to be anticipated under different operating methods.

Close study of the experiences of these organizations shows, of course, that their growth, efficiency, and costs depend vitally upon (*a*) the class of membership, (*b*) the type of organization, (*c*) the limitations and rules governing the benefits, and particularly (*d*) the quality and efficacy of the direction and control. The cohesive memberships of associations like those of the Hollinger mine and the Winnipeg Firefighters are obtained almost automatically, and can be controlled firmly—even rigidly—without establishing antagonisms; the employee groups which are the main objectives of the Windsor and Vancouver plans are less easily secured, though a comparatively small number of such groups will give a broad basis of operation, with opportunities for simplified administration; the preponderantly individual contracts of Associated Medical Services necessitate more attenuated administrative methods, and cannot be handled by such inelastic rules and orders as those appropriate for an employee group.

These essential differences are naturally reflected in variations between the cost figures of such plans. For that reason it is usually difficult to reduce all the data to a strictly and reliably comparable basis, and great care must be exercised in any attempt to do so. Certain general indications, however, may be stated, with the specific reservation that they should be taken as representing only the approximate regions in which the several costs may be expected to lie, and that considerable variations may be shown in some or all of the constituent items as a result of differences in available facilities, scales of payment, and type of plan. Thus for an urban group of males, females, and minor dependents there is much evidence to show that for minimum essential services (including confinements, and excluding dentistry and preventive services) the costs would ordinarily lie between about $17.50 and $22.50 per annum for each person included in the group (*i.e.*, as an average for every individual, whether or not he makes any claim for services), and that over a large group a similar average contribution of about $18.00 per person per annum would cover the required services in approximately the following proportions: General Practitioner, $5.00; Specialists and Surgery, $3.00; Hospitalization and Nursing, $5.00; Laboratory, X-ray, etc., $1.00; Drugs and Appliances, $1.50; Administration (15%), $2.75; giving a total of $18.25. Under the conditions of some rural practices, of course, wide changes would occur in these tentative allocations, and for either urban or rural communities much will depend on the percentage of any stated fee schedule which is to be secured.

The waning of tuberculosis, apparent in all countries with advanced civilization, has been less spectacular than the conquest of other diseases, but has meant a greater change in the well being of the population, and a greater rise in its average longevity, than the eradication of any other. Under way at least a century ago, it has continued with only occasional interruption to the present. The factors responsible have been lengthily debated, and the influence of specific anti-tuberculosis measures seriously questioned. In more recent years, however, there has been little argument against the claim that organized anti-tuberculosis campaigns have at least definitely accentuated an already favourable process. It is probably a fair statement that, if the anti-tuberculosis campaign is not yet responsible for the decline of tuberculosis, its organization is so powerful, and its principles so sound, that it must inevitably become so.—The Decline of Tuberculosis, E. R. Long, *Bull. Hist. Med.*, 1940, **8**: 819.

The War

Dietary and Pharmaceutical Notes

An emergency substitute for medicinal cod-liver oil for human use is to become a legal standard formula under the Food and Drug Acts. This substitute, necessitated by the suspension of the imports of Norwegian cod-liver oil and the diversion of our own fleets to war activities, will be made from groundnuts, the seeds of Arachis hypogoea, native to Brazil and widely cultivated in India, West Africa, China and America. The oil will be vitaminized to contain the same proportions of vitamins A and D present in a good average specimen of oil expressed from the fresh liver of the cod. It is understood that a monograph on this emergency substitute will be the first war-time addition to the British Pharmacopœia and will be published shortly by authority of the General Medical Council.

Considerable quantities of sugar are used annually in the preparation of medicines and, while it has not yet been thought necessary to ration sugar for medicinal purposes, the Ministry of Health urges economy in its use. The present position requires that supplies of sugar should be directed into forms in which they are most valuable as food and the prescription of preparations containing sugar could be, states the Ministry, restricted almost entirely to medicines for children without any serious loss of therapeutic efficiency. Economy is also urged in the use of citric acid and citrates, cod-liver oil, starch, animal and vegetable oils.

Since the outbreak of war there has been much complaint from poultry farmers regarding the shortage of feeding stuffs. According to Sir John Orr, however, it is unpatriotic to demand eggs in war time, because the hen needs three times as much food as the cow to produce corresponding amounts of human food. Although the egg is of great dietetic value and contains all the "protective" material required for human existence, with the exception of vitamin C, its cost outweighs its advantages and it is a luxury article compared with milk. Eggs as a source of energy cost over three times as much as milk; twice as much as a source of protein; 14 times as much for calcium content; four times as much as a source of phosphorus; three times as much for vitamin B_1 and very much more than that as a source of vitamin C. Calves' liver is a cheaper source of supply of iron; cheese provides vitamin A at a twelfth of the cost of eggs, and tinned salmon supplies vitamin D at a tenth of the cost. While the egg provides much nutrition in a very compact form, Sir John Orr, by presenting these facts of comparative cost, surely shatters its reputation as an economical food.—From the *Journal of the Royal Institute of Public Health and Hygiene*, 1940, **3**: 141.

Blood Transfusion

At the April meeting of the Pathological Society of Manchester, with the President, Dr. A. Hillyard Holmes, in the chair, Dr. J. Goldman opened a discussion on blood transfusion.

General Considerations

Dr. Goldman said that there were three main indications for blood transfusion: to replace blood loss, to combat surgical shock, and to help the bactericidal properties of the blood. Blood could be given by direct or indirect methods. The former was more rapid but more difficult; the latter, using coagulants (citrate), had many advantages—blood could be given slowly and the patient could be at a distance from the donor. The disadvantage was that the blood was modified. Efforts to find whole-blood substitutes have not been entirely successful. Three were of interest: (1) 5 per cent hæmoglobin Ringer solution—no proof of good effects; (2) human serum—better than gum saline and easy to get (the disadvantage was the necessity for laboratory procedures); (3) pooled plasma—probably the best of the three. For straight erythrocyte deficiency there was nothing like whole blood, but for shock other methods were valuable; in these cases the aim was to increase blood volume to normal and not to increase the number of red cells. Plasma was obtained aseptically from blood by standing it twenty-four hours or by centrifuge, and kept in a sterile bottle with an equal volume of saline. It could be evaporated *in vacuo* to a dry powder and reconstituted as required by the addition of distilled water. It could be stored much longer than blood, did not need to be typed nor to be kept in a refrigerator. It could be given intramuscularly as well as intravenously. Efforts had been made to use modified whole blood. Cadaver blood, taken several hours after death from non-transmissible disease, had æsthetic objections; in placental blood there was a large reservoir of supply and it had a high content of bilirubin, potassium, calcium, and copper, but the technique was difficult. Heparin had the advantage of being a very active natural coagulant but was expensive. Transfusion with heparin could be performed: (1) *"in vivo"*, giving 1 mg. per kilo to the donor and bleeding eight minutes later—

the coagulation time was increased eight to ten times and the blood remained fluid for sixty to ninety minutes; (2) *"in vitro"*—heparin replacing citrate. It was found that 1,000 units of heparin kept 100 c.c. of blood fluid for one to two hours. It had few advantages over citrate; within an hour leucocyte and platelet agglutination was occurring.

At present the best method appeared to be to use a citrate dextrose anticoagulant, keeping the blood aseptically at 2 to 6° C., and warming at least to room temperature before giving it. It was available for immediate use at any time or place. Stored blood gradually deteriorated on keeping. Up to seventy-two hours the technique of giving stored blood was as simple as giving fresh blood; after this time a gelatinous clot appeared which blocked tubing and needles. After ten days most bloods would block the tubes and needed rigorous filtration. On storing dextrose citrate, hæmolysis began within three days, leucocytes began to degenerate within twelve hours, and platelets were agglutinated within twenty-four hours. The rate of erythrocyte destruction was retarded by a positive oxygen tension and hastened by trauma or a temperature over 8° C. Other changes that occurred were a diffusion of potassium into the plasma and a loss of complement. Stored blood had a definite part to play up to five days; after this time it was better for the plasma to be taken off and used alone. Whole blood could not be replaced altogether and stored blood became more artificial each day it was kept.—From the *Brit. M. J.*, 1940, **1**: 827.

The Treatment of War Fractures

At a meeting of a medical society of the B.E.F. on April 18th, with the president, Colonel F. Whalley, in the chair, Colonel Max Page read a paper on the treatment of fractures of the extremities under war conditions.

Colonel Page pointed out that the main difference from civil practice which had to be considered in war was the preponderance of open fractures due to direct injury. Another factor which influenced the method of treatment of these injuries in an expeditionary force was the need to employ apparatus which left the patient transportable in comfort and safety at short notice. He proposed to consider, first, the general principles which were applied to avoid or minimize wound infection, and, secondly, the specific appliances suited to various fractures during the movements of the wounded man from the field to the base. These latter observations would apply to simple as to open fractures.

It was now generally accepted that wound excision (the *épluchage* of our French colleagues) was the only effective procedure which could check infection in contaminated wounds. To be effective this cleansing operation should be undertaken as soon after injury as possible. If the patient did not come into the surgeon's hands for about eighteen hours or more after being hit, free wound excision was no safeguard and might be dangerous. In such instances a full prophylactic course of sulfanilamide should be given. He thought that operation in late cases should be limited to the removal of easily accessible foreign material and the establishment of drainage. In the operation of *épluchage* he deprecated the excision of any viable skin, though free incision was necessary for proper access. It must be admitted that a really complete wound excision was seldom practicable in the case of open fractures caused by missiles. Conservation of important neurovascular bundles was the first handicap, and the undesirability of removing all detached fragments of bone the second. In general, fragments with periosteal or vascular attachments should be left *in situ* except in such instances as fractures of the patella, where complete removal would not materially interfere with subsequent function. Lavage of the cavity after the completion of excision was a common practice. If employed, a solution of acriflavine (1 in 1,000) was probably the least harmful solution to use. In his opinion primary suture was not justifiable in these injuries, and drainage should be established by means of a light gauze or petroleum jelly pack. He did not think tubes or rubber dams very satisfactory, and no skin sutures, if under tension, should be inserted. The packing of excised wounds with 5 to 15 grams of sulfanilamide powder was strongly advocated by some American authors. The powder had a local antiseptic value as well as procuring a fairly rapid concentration of the drug in the blood. The method, however, must be regarded as still on trial.

The next step was to reduce the fracture as far as possible, and then to immobilize the parts securely. When there was much overlap of fragments he thought it undesirable to apply heavy traction during the first few days in order to secure reduction. Heavy traction increased the intra-aponeurotic pressure and so reduced the local blood supply at a time when a full one might be vital in combating infection. Avoidance of tension in and around the wound was most important during the period of reaction or early inflammation. For fixation the skeleton splint, as exampled by the Thomas, left wounds accessible and made traction possible. Plaster-of-Paris casing had the great merit of immobilizing the parts completely; access to wounds was not allowed, but, as had been shown by the results of the Winnett-Orr and Trueta methods, this was not a bad thing. He would emphasize, however, that the whole plaster cast, whether padded or not, could be a grave danger when applied to a man to be transported soon after its application. Under these conditions it should be a rule to make a single cut in such plasters

right through from end to end and down to the skin and then re-bandage. This was the only way to avoid the disasters which occurred from rigid casings when the patient could not be kept under close observation for a few days after their application. He would not dwell at length on the development of serious infection in these cases as it was too extensive a subject. The early recognition of anaerobic infection was most important and should be based on clinical observation. Prompt surgical intervention was indicated, whether only local or in the form of amputation. Streptococcal infections should not be treated surgically in the acute stage but reliance placed on sulfanilamide. When infection had been avoided or overcome the next care would be to associate the restoration of function in the limb with the period of immobilization necessary for union to occur in the fracture. In times of stress little could be done in France in this direction, but in quieter periods it should not be overlooked. The problem of splintage of individual fractures should be considered in relation to three phases in the wounded man's course: first from the field to casualty clearing station, secondly at the C.C.S. and during his transit to the base, and thirdly at the base and during his transfer to England. For practically all fractures of the femur the Thomas splint served best when transportation was in view. Even if it was bent at knee level it could be propped up or lashed to the standard suspension bar on the stretcher. From the field to the C.C.S. the clothes and boot should not be removed. The spring heel-clip afforded a satisfactory attachment for traction. If the ring of the splint employed was too large it tended to slip up against the pubes and caused great discomfort. For transport from the C.C.S. under normal conditions he thought that an adhesive traction appliance was the safest. The amount of pull required was not very great at this stage. At the base the case might be retained for some time and the fragments should be aligned as accurately as possible. Traction by pin or wire would be desirable. Generally the tibia would be transfixed just below knee-joint level. He was strongly opposed to transfixion of the lower end of the femur, as he had so often seen the procedure result in permanent limitation in knee movement even when gross infection of the joint had not been present. The splint employed at the base would generally be a Thomas or Braun. The latter, however, was not suited for transport, and would necessitate a change if rapid evacuation became necessary.

Fractures into the knee-joint would be treated in general as fractures of the femur, as outlined above, though he favoured the use of a full plaster case in the later stages. A plaster case which was to fix the knee properly must include the pelvis, and this fact made the method somewhat cumbersome on active service. For fractures of the tibia and fibula, box or wire splinting would be used in the field. At the C.C.S. he considered these injuries were best treated in a plaster case. He preferred to use stockinet as padding, but in all cases emphasized the importance of cutting through the whole case if the man was to be transported soon after application of the cast. Open fractures of these bones, especially when they occurred in the lower third of the leg, would often be best treated by primary amputation. When the posterior neurovascular bundle had been torn across and bone injury was severe, there was little doubt it would save a dangerous and prolonged convalescence. Traction through wire or pin was sometimes necessary for missile fractures of tibia and fibula, but not so often as for simple fractures; such treatment would not be applied till the base was reached. He thought there was a tendency to employ traction for fractures of these bones more often and longer than was necessary. Alignment, control of rotation, and good position of the foot were most easily secured by plaster-of-Paris. Fractures of the humerus were comfortably and safely moved from the field to the C.C.S. if the arm were bandaged to the padded side and the forearm supported in a sling. For lower shaft fractures the addition of wire splinting might be desirable, as it was for the forearm. From the C.C.S. to the base, if the fracture was in the upper third of the humerus, similar measures were sufficient. For fracture of the lower section of the shaft he thought plaster slats carried from above the shoulder to the hand were satisfactory. He did not favour the use during transport of any of the splints which exerted pressure in the axillary area. For the C.C.S. treatment of forearm fractures a similar arrangement was often adequate, though a whole cast might be more efficient. The same advice as given above for section of such plasters was urged. At the base no doubt many different appliances for upper extremity fractures could and would be employed. He would say that transportation in the abducted position was seldom satisfactory, and the use of a plaster case in a more normal attitude was most likely to be so.—From *Brit. M. J.*, 1940, **1**: 948.

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(Other references can be found here.)

MISCELLANEOUS

Blood Transfusion—A discussion, *Brit. M. J.*, 1940, **1:** 827. (See above).

New Names in Drugs, *Brit. M. J.*, 1940, **1:** 824.

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War Guests

Leamington, Ont., July 12th.—Mr. Howard Heinz, President of H. J. Heinz Company of Canada Limited, whose principal plant is at Leamington, Ontario, has just announced that he has issued an invitation to the employees of H. J. Heinz Co. Limited in Great Britain, who number several thousands, to send their children to Canada and the United States for the duration of the war at the Company's expense.

Mr. Heinz plans that so far as is possible, these British children shall be cared for as war guests in the homes of the employees of the Canadian Company but that any who cannot so be placed in the Dominion shall be welcomed in the homes of Heinz employees in the United States. Mr. Heinz' plan is being enthusiastically endorsed and supported by the entire personnel of the Company.

Mr. Heinz is a member of the United States Committee for the care of European children, of which Marshall Field is Chairman.

It is one of the peculiarities of medical superstition that it attributes every ordinary and natural effect to extraordinary and unnatural causes; thus we find in the times of superstitious delusion that even the salutary effect of well known herbs were attributed to the influence of the planet under whose ascendency they were collected, rather than any intrinsic property in the herb itself.—William Wadd.

Association Notes

The Annual Meeting at Toronto

It is said that "comparisons are odious", so we do not propose to make any. Wherever the Association meets, in any city of Canada, whether great or small, it is assured of a hearty welcome and the best that is going. So we always have to indulge in superlatives and not in comparatives. Any advantage the big cities possess in the matter of conventions lies in the size of their medical population and their greater resources; but, enthusiasm is always and everywhere at the peak.

The Seventy-first Annual Convention of the Canadian Medical Association, just held in Toronto, must be considered as one more in the long list of successes. The weather, while cool, and possibly unseasonable, added much to our comfort and enjoyment. The arrangements were excellent and worked smoothly. The attendance was gratifying, 1,604 doctors and 288 ladies being registered. The program was excellent. The round-table conferences, which proved so successful in Montreal, were elaborated still further and again proved their usefulness and popularity. The various sections were well attended and the contributions were up to standard.

Without intending to be invidious, a word or two may be said about two of the sections. As might be expected, the section on Military Medicine was particularly good, and was fortunate in having with it Col. R. M. Gorssline, D.G.M.S., of Ottawa, who contributed much of value to the discussions. The section of Historical Medicine held its meetings in the appropriate atmosphere of the Academy of Medicine. It was made specially interesting in that there were many illustrative exhibits—postage stamps of medical and pædiatric interest; the Klotz Library; book plates; Osleriana; the "Johnston Cabinets", containing slides used by Johnston, Bovell, and Osler; and a collection of lecture cards, medals, diplomas, and instruments relating to early Ontario medical men. A unique feature was the contribution of Dr. Edwin Seaborn, of London, Ont., whose paper on "Indian medicine in Western Ontario" was embellished by the singing of Pe-wak-a-nep, an Ojibway who was the son of a medicine-man of his tribe. The songs were most striking and were accompanied by obligatos on the Indian drum. They related mostly to the spells which the medicine-men endeavoured to weave for the benefit of their patients.

The Scientific Exhibit is worthy of special note. Not too large for convenient study, the material presented was set up excellently well. The popular topic at the moment—lesions of the spine, vertebræ and intervertebral discs—was well covered, in all its aspects, and was most instructive.

The Commercial Exhibits, attractively set up and conveniently accessible, seemed to receive their due meed of attention.

One noticed about the Convention an air of subdued seriousness, in keeping with the circumstances in which we, unfortunately, find ourselves at the present time, but this did not detract from the success of the meeting. It had been debated whether we should have this year any program of papers, or whether we should not restrict our aims to a business meeting only. Also, whether a social entertainment was desirable at this time. After due consideration, the program committee decided, we think wisely, to plan for a meeting along the usual lines. The result justified their course. Far better, to carry on as usual than to encourage a spirit of "mopishness".

Needless to say, for a great convention, such as this was, to be carried on smoothly and effectively numerous committees characterized by wisdom, foresight, and diligence are obligatory. To the many who contributed of their best the Association returns thanks. To the ladies of Toronto, who entertained so lavishly and so gracefully the Association is also grateful. To President and Mrs. Duncan Graham we owe a special debt. Let us carry on in the same spirit.

The President's Valedictory Address

BY F. S. PATCH

Montreal

It is a custom of the Association that an address shall be delivered by the retiring President at the conclusion of his term of office. The practice is so firmly established that I, who am very appreciative of the dignity and importance of the office with which the Association has honoured me, and with a very proper degree of gratitude to the membership, gladly conform to this valedictory performance.

There is something to be said in favour of the inclusion in the academic and scientific sessions of the annual meeting of matters which would otherwise lie hidden in the transactions of General Council. After all, you represent the electorate of the Association, whose parliament is the General Council, whose cabinet is its Executive Committee. The opportunity of speaking to the electorate is therefore one which a President should welcome, an opportunity of reviewing before you, even in a very cursory way, the main accomplishments of the year.

It has been my lot to occupy the office of President of this Association in a memorable year, one in which the Association has been faced with many important responsibilities. When the Association last met in Montreal the thought of Canada's involvement in war was very far from the minds of most of us. The unleashing of the forces of war by totalitarian aggressors came with an impact the more crushing on that account. On the outbreak of war your Executive Committee, mindful of the loyalty of every member of the Association, interpreted what it thought would be your wishes in the crisis so suddenly thrust upon the Empire and sent to the Prime Minister of Canada a message of loyalty, coupled with an offer of support with all the proper resources of the Association. It was quickly indicated that such an offer was welcome, and we were asked to suggest in what manner the Association could render helpful service. Guided by what had previously been done by the British Medical Association, to which body had been allotted an important rôle by the British Government, your Executive stated it could help in two ways—

1. By the preparation of a voluntary register of the medical profession of Canada, embodying appropriate data, particularly as to medical qualifications and the possibilities of service in the emergency.
2. By the establishment within the Association of advisory committees, central and divisional, to give advice on medical matters to any department of Government, if and when requested.

The Executive Committee was actuated by several points of view—

1. No one should question the paramount importance of purely military considerations, and of the necessity of giving them the full support of the medical profession. None the less, there was a strong conviction that there should be a co-ordination of effort in meeting the military and civilian needs of the population in the emergency. It was important that medical man power should be conserved as much as possible and that the medical efforts should be made with the maximum amount of efficiency and yet with the least dislocation of effort in meeting both military and civilian requirements.
2. An honest desire to co-operate with and lend assistance to the departments of Government involved, without encroachment upon the proper functions of their appointed officers.

Following upon consultations with the Ministers and officers of the Departments of National Defence and of Pensions and National Health, in which the proposals above outlined were accepted on behalf of the Government, the Executive Committee was convened in extraordinary session in Ottawa. At this meeting immediate action was taken. Using the term suggested by the Prime Minister, the Executive Committee formed itself into a National Medical Co-operative Committee. The issue of questionnaire cards was arranged, and a small committee, the Central Medical Advisory Committee, was formed, with Local Advisory Committees in each military district.

1. THE QUESTIONNAIRE.—It should be remembered that the Association's Section of Military Medicine, under the Chairmanship of Dr. W. H. Delaney, had been instructed by General Council to study this question and had laid plans for such a registration. With the advantage of the studies of this Committee, and using as a basis the card originally suggested by it and modified by the Quebec Division for local use, a card was printed and sent to all members of the medical profession in Canada. The response to the questionnaire was most satisfactory. Eighty-five per cent of the profession of Canada has completed and returned the cards. This figure indicates in no uncertain way the loyalty of the medical profession and its willingness to assist in the national emergency. The information secured has been transferred to punch cards. From these cards any tabulation of data can be quickly secured, and information derived from them has been freely used by the military authorities in many military districts.

2. THE ADVISORY COMMITTEE.—It is still too early to evaluate the work of the Advisory Committees, with the exception of the Central Committee, which has met frequently, usually in Ottawa. Its help has been solicited on many occasions and on many subjects. I must admit that the advice given has not always been followed. One of the important activities of the Central and Local Advisory Committees has consisted in furnishing information to the military authorities upon the professional qualifications of those volunteering for military service.

The year has indeed been a memorable one. A rapid succession of startling events has kept the world in a state of tension. Old methods of destruction, amplified by newer and even more devastating ways of taking human life, by land, by sea, and by air, have horrified the world. Hapless and helpless neutral nations have been ravaged and overthrown, women and children incontinently slaughtered by the uninhibited powers of totalitarian aggression, who are waging this war with a cold fanatical fury almost inconceivable, and with a barbaric ruthlessness that is unparalleled in the history of the world. In the midst of these distractions, so accentuated since this was written, it is not easy to focus our attention on the ordinary and routine affairs of daily life. Yet it is necessary that, while we stand and wait, we must carry on with these duties, no less with the business of the Association. In keeping with that thought it appears to me to be quite proper for me to briefly review the outstanding activities of the Association's year.

The present time finds the Association with every evidence of prosperity, in fact, at the high water mark in its history. The forward movement initiated at Halifax in 1922 has been well maintained. The confident faith of our wise and steadfast leaders of that time has been more than amply justified. In the last few years, there has been a subsidiary, but no less important, renascence in the so-called federation movement, to which those dynamic crusaders, McEachern and Routley in 1934 and 1935 gave such an inspiring impetus. During the year the Divisional ranks were filled, in itself a striking tribute to the unity and solidarity of the medical profession of Canada.

The membership of the Association, I am happy to state, is steadily increasing. It should be obvious to the most casual observer that the benefits to be obtained from medical organization warrant an even larger enrolment of Canadian doctors under the banner of the Canadian Medical Association. To this end the Association and its Divisions should spare no effort to increase their membership. In these days of disturbed and rapidly altering economic conditions changes in the social framework seem inevitable. These may profoundly affect the medical profession. Measures of social reform are likely to be proposed. The profession should be in a position to protect its paramount interests, with no division of its opinion, without dissension, and with no break in its ranks. A strongly organized and united profession is much more likely to attain its rightful aims. In my opinion, the Canadian Medical Association, with its national and provincial organization, offers the best means of maintaining the influence and the integrity of the medical profession of Canada.

The conflict now raging will undoubtedly call for the utmost skill in management. Fortunately, the Association is in a better position than in 1914, when it was ill-prepared and nearly foundered. For the present the policy is to carry on, unless circumstances arise to make modification of this policy necessary.

Two of the outstanding accomplishments of the year have been in the field of nutrition, and the holding of the second Maritime Conference.

Your Committee on Nutrition, under the Chairmanship of Dr. F. F. Tisdall, has had a very active year. Its work, in co-operation with the Canadian Life-Insurance Officers' Association, has been continued. A booklet for distribution to the general public entitled, "Food for Health in Peace and War", has been prepared. Three million copies of this publication are to be distributed throughout Canada. The entire costs of publication and distribution are being borne by the insurance companies of Canada. The Association may well be proud of its share in this achievement. Mingled with our pride should be a very keen appreciation of the co-operation of our Canadian life-insurance companies who made this valuable public health measure possible on such a large scale.

In addition, the Association, through its Committee on Nutrition, has been able to do something in securing an improvement in the food ration of the Canadian armed forces. This effort was begun on the suggestion of the Central Advisory Committee. Your Committee on Nutrition, in collaboration with Governmental Committees, succeeded in obtaining a revision of the Army ration list. A further recommendation was made to the military authorities, advising the appointment of an authority on nutrition, to advise them on matters concerning the feeding of the troops. To this the Government acceded, and Dr. Tisdall, the Committee's Chairman, has been selected for this post.

MARITIME CONFERENCE.—As a result of the initiative of your General Secretary and the co-operation of the Maritime Divisions, the practice of holding a Maritime Conference was revived. A largely attended meeting of representatives of the New Brunswick, Nova Scotia, and the Prince Edward Island Divisions was held in Moncton, April 29th and 30th. At the conference many subjects of common interest were discussed and recommendations were made to their respective Divisions.

Among the measures studied were proposals to have the annual meetings in the Maritimes held in sequence and the publication of a Maritime bulletin. Very important was the suggestion that a joint annual meeting of all three provinces be held triennally. If this is done in the years when the parent association in meeting in the Western provinces, many practical advantages will accrue to all the parties concerned. The Association would be well advised to regard such a meeting as an integral and important part of its activities and use every supporting effort in its power to ensure and increase the success of the undertaking.

Having had the privilege of participating in this conference, I was profoundly impressed by the possibilities of such meetings, and convinced of the value of an extension of the practice to other parts of Canada. I am optimistic enough to visualize the time when the Association will be in a position to support the appointment of regional secretaries, on part or full time. In my mind there can be no doubt of the wisdom and value of such a proceeding.

From all points of view, the second Maritime Conference was a great success. It is hoped that the measures directed towards an increased co-operation which were suggested at the conference may have fruitful results. The spirit of friendliness which animated the participants convinces me that much good will come from the meeting, and that the results obtained will warrant its resumption at regular intervals.

It is perhaps not generally recognized, nor sufficiently appreciated, to what extent Canadian life-insurance companies are co-operating with the Association and other organizations in the promotion of general health measures in Canada. Reference has already been made to the notable contribution of the Canadian Life-Insurance Officers' Association in the field of nutrition. In addition to this, for many years the organization maintained the Association's Department of Publicity and Health Education.

One Canadian life-insurance company is worthy of special mention. In addition to participating in the work of the Canadian Life-Insurance Officers' Association, the Sun Life Assurance Company has made very generous contributions on its own behalf to two important activities of the Canadian Medical Association. For several years the Sun Life has made possible the Association's program in the field of post-graduate education, and from 1926 to 1932 inclusive donated to the Association yearly the sum of $30,000, or $210,000 in all. To our great regret this grant had to be discontinued in the years of depression, and financial conditions have not permitted its renewal.

Perhaps no activity of the Association has been so valuable, not only to the medical profession but indirectly to every citizen of Canada, as the post-graduate program of the Association. It may be difficult

to establish mathematically the value of the post-graduate lectures but one can have no hesitation in saying that the results far exceeded the financial outlay. I trust some benefit accrued to the Company. There is no doubt the physicians of Canada profited and that the benefit was in turn transmitted to their patients.

The results of efforts of this sort may not be evident and the dissemination of health knowledge rather intangible. I am convinced that the standards of medical practice were elevated in no small degree. In travelling about Canada one hears on all sides the query—when are the post-graduate lectures to be resumed? The Association has so far been able to provide in its budget for post-graduate lectures only to a limited extent. This effort falls far short of what was accomplished during the years of the grant. We look forward with eager expectancy to the day when this generous company can see its way clear to resume its contributions. Some assurance, indeed, has been given us that this will be done as soon as financial conditions permit. In any event, the Association must always be grateful to the Sun Life Assurance Company for what it has done in this field of community and public health service.

To the same generous benefactor the Association is indebted for the foundation and continued maintenance of one of its most successful activities, the Hospital Service Department, under the skilful and enthusiastic leadership of Dr. Harvey Agnew. Perhaps the most outstanding contribution of this Department is in the way it acts as an intermediary between the professional and administrative interests in hospital work, and in the manifold services which it has been able to render to hospitals throughout the country, particularly the smaller ones. Noteworthy are its work in the standardization of hospitals approved for internship, and its participation in the founding and assistance of the Canadian Hospital Council. In the Department has been built up the Blackader Library, which contains a carefully indexed file of literature as complete as it is possible to make it, the finest hospital library in Canada. With these facilities the Department is rendering valuable service to Canadian hospitals. This service is constantly being given, freely and without publicity. It is perhaps some indication of the position this Department of the Association occupies in the hospital world of this continent and of the standing of its Director, that Dr. Agnew was honoured last year in being elected President of the American Hospital Association, which held a most successful convention in Toronto last September.

ANNUAL MEETINGS.—In the last five years, it has been the policy of the Association to delegate to the Central Program Committee the duty of preparing the scientific program of the Annual Meeting. It is obvious, I think, that the Annual Meetings of the Association have shown a steady improvement in their scientific character. More time is being devoted to the scientific program, and there is an improvement in the quality of the papers submitted at the general and sectional meetings. The round-table conferences on subjects of practical and clinical interest seem to have been a most welcome innovation, and, if further experience shows the scheme to be a popular one, they will probably be extended. It is true that a certain amount of business has to be transacted at annual meetings and that there must be some relaxation and that some cultivation of the purely social aspects of medical intercourse is highly desirable and necessary. None the less, these social functions are of subsidiary importance and should not be permitted to interfere with the scientific activities of the meeting. They certainly should not be allowed to dwarf in any way its educational purposes, nor become a burden upon the hosts at any convention. In my opinion, the enlargement of the program at this Toronto meeting is of the utmost importance to the Association and to its membership. The Central Program Committee, working so efficiently and without ostentation, is entitled to our warmest thanks.

No presidential address of the last decade has failed to make some reference to the topic of medical economics. My own task is the easier because of the very constructive action of General Council at its Montreal meeting, in appointing an actuarial expert to assist the Association in its economic studies. The Association may count itself extremely fortunate in securing the services of Mr. H. H. Wolfenden. Already he has done much to clarify a confused situation and enabled us to direct our course in main channels, along a course which is to some extent uncharted, and perilously filled with rocks and shoals. The excellent articles which he is publishing in the *Journal* are gradually bringing light into places which for most of us were dark and incomprehensible. As a result of his studies, the medical profession of Canada, if it should be faced in any province with social legislation, will be in a better position to enter into any conference on the subject with a degree of unanimity and of formed opinion on the principles to which it may subscribe.

No longer should the subject of medical economics be regarded as a bogey which may not be discussed except behind closed doors. The question is a very live one and concerns every one of us in the most vital manner. The greatly increased cost of medical care, or that type of medical care that may be regarded as adequate, has made it very difficult for the average individual to meet the cost of illness to himself or his family. In the past the medical load was not too burdensome and such individuals were cared for by private charity, to which the doctor very willingly contributed, in keeping with the best traditions of his profession. Unfortunately, the springs of private charity are being dried up and the amount of unremunerated work exacted of the medical profession is becoming a heavy burden. This has insidiously effected a striking change in the relationship of the physician to the community. That such a situation will tend to effect its own recovery is shown by the fact that already remedial measures are being applied, which help to "shift the burden of medical relief from the shoulders of the medical profession to those of the general public and governments, where it rightly belongs." Voluntary organizations are providing medical benefits on an insurance basis for those who are able to pay for them and have the necessary forethought. Industrial corporations are providing in some measure and in many diverse ways for the care of their employees, with or without the active participation of the employees. Workmen's Compensation insurance schemes are in effect almost universally. Practically all these innovations are limited to individuals of the population who are earning a sufficient amount to permit of some contribution on their part, directly or indirectly. There remains the problem of the indigent and of those not earning enough to contribute to their medical care. For this class of our population but little relief has as yet been provided. In only a few isolated instances in Canada have provincial governments acknowledged any responsibility in the matter, and, where hospitalization has been provided, for the most part no provision has been made for remuneration of the doctor for his medical services. A great American recently declared that the care of the dependent was one of the "permanent obligations of government in a complex industrial society", such as prevails on this continent today. Unfortunately, this principle has not been generally accepted by governments. It is probable that remedial measures will be applied piecemeal, and as far as Canada is concerned it is likely that action will have to be taken provincially. It is regrettable that governments in this country have not fully awakened to the urgent necessity of action on their part and in a way which meets, at least half way, the medical profession, which

must necessarily play so important a part in any scheme of relief.

The Association, at its 1934 meeting in Calgary, laid down principles by which it should be governed, if and when any government should bring in a compulsory health insurance scheme. Although our Committees on Economics have done an immense amount of valuable work, and more recently, the present Committee, under the active and capable chairmanship of Dr. Wallace Wilson, the Association has made no definite decision on this question. It is my personal opinion that the lapse of time has demonstrated that the problem is solving itself by the establishment in various areas of voluntary health insurance schemes, leaving only the problem of the indigent for solution. That this is a definite responsibility of government and not of the physician I am firmly convinced. The time has come for the medical profession and the Association to take a more active and direct interest in the problem. Above all, they should endeavour to give a leadership to the country, a leadership which, from the position the medical profession occupies in our national life, it is rightly entitled to assume. This may not be the opportune moment to exert any pressure, in any direction. None the less, the Association should be quietly preparing for happier days and the inevitable reconstruction that will follow, in God's good time, these turbulent and troubled ones, to take active steps to obtain an adjustment of the economic disabilities of the medical profession. This is our most pressing responsibility at the present time. It is a very definite challenge to us, and in the way in which the challenge is met by the profession of Canada and by this Association, its most representative organization, will depend their security and well-being in the years to come.

In this connection, the action taken by General Council yesterday at the suggestion of the Chairman of the Committee on Economics is most commendable. Council authorized the employment of a full-time associate secretary, in the field of medical economics, should circumstances warrant this step being taken at any time.

It is a matter of regret to me that time will not permit to mention, not even by name, many activities of the Association which have been continued during the year. Mention should however be made of the untiring efforts in many fields of your General Secretary, whose energies, after a service of over twenty years, seem unabated. Almost single-handed he has carried through the Radio Broadcasting program of health talks over a Canadian network, made possible by the collaboration of the Canadian Broadcasting Corporation. He has extended the activities of the Department of Cancer Control. His representations to the Federal Income Tax Department to secure adjustments in favour of the medical profession have been most effective.

It has been possible to maintain the *Journal* at the same standard of excellence as in the past. There have been discussions on the possibility of increasing the number of issues. Financial considerations so far prevent this being done.

The Committee on Constitution and By-laws has completed its very arduous work of consolidating the constitution of the Association, excellent evidence of the unity and solidarity of the Association and its Divisional organizations.

It should be evident from all this that the Association continues to grow in stature and influence, devoted to the improvement of health and the prevention of disease and the maintenance of the integrity and honour of the medical profession. The benefits which it provides are not limited to the Association's membership alone. They are available to the whole community of the general public, including those of the profession short-sighted enough to evade their responsibilities by failing to become members of the Association.

In the light of the happenings of the last few weeks I have felt some hesitation in discussing matters which seem so futile, when every thought, every action should be devoted to one purpose and to none other. Distracted, if not dismayed, by the daily evidence of the ravages of war, our peaceful gathering is overshadowed by the portentous happenings in the world about us. In peace the medical profession has never failed in its daily tasks of unselfish service. No less will it fail to act with devotion, unflinching service and sacrifice, in the crisis to which we are now opposed. Though the call to arms of the medical profession has not sounded loudly as yet, when it does, the medical profession will answer with the same loyal response as it did 26 years ago.

To those responsible for Canada's military effort we owe the fullest and most disinterested support. In spite of the relative unpreparedness in which Canada found herself at the outbreak of the war there should now be no recriminations. On the other hand, there should be no delay in effecting the fullest mobilization of our medical resources and in making adequate and timely preparations for the urgent requirements of the future, not unmindful of the lessons learned 25 years ago.

Modern invention and ingenuity, the sinister application of the scientific discoveries of peace to the frightful devices of a primitively brutal warfare, have invaded the sheltered security of this continent. No longer does a wide sea offer its protective shield.

In this emergency there can be no question as to the attitude of the medical profession and of the Canadian Medical Association. I am confident there is none who will withhold the fullest support and loyal service to the Government and people of Canada, and that in whatever capacity, in whatever sphere the call to service shall come, the response will be both prompt and willing. Let us in this solemn hour pledge ourselves to the righteous cause of the Empire and the Dominion, with unshaken faith in the outcome of the issue in which we are now joined.

British Guest Children

The following letter has been sent to the secretaries of all Divisions of the Association on July 11th.

Along with a number of other persons interested in the problem, I have just returned from a two-hour conference with the Minister of Welfare of the Province of Ontario, when plans were discussed in considerable detail with respect to the reception of British children as war guests in Canada. I came away from the conference with the distinct understanding that the following plan has been agreed upon by the Dominion and Provincial Governments:

1. That the Dominion Government will be fully responsible for the transportation and necessary care of children between the ages of five and sixteen years, from the point of embarkation in the British Isles to the designated town or city in Canada, at which point the Provincial Government assumes responsibility and exercises authority.

2. The Provincial Government through its Welfare Department or department performing welfare service, will be responsible for the placing of the children in their foster homes.

3. The homes which are offered are to be listed with the Welfare Department through its

local office in the area, by which department the homes will be inspected and approved.

4. Hosts will be expected to provide maintenance and all other costs of these children in a manner similar to the care they would give their own children, with the exception that the Dominion Government will be responsible under certain conditions. Here let me quote from the official memorandum issued by the Department of Public Welfare of the Province of Ontario:

> "Should illness develop after the child has been placed, the host will be expected to provide ordinary medical care in the same manner as he would if the child were his own. Under no circumstances, however, will the host be called upon to bear the cost of hospitalization or of major medical care. This responsibility continues to rest with the Dominion Government. In the case of serious illness, the local Children's Aid Society must be notified immediately."

5. Careful records will be kept in the Province of the foster homes designated for any special groups of children such as doctors' homes for British doctors' children. As doctors' children arrive in Canada they will be placed in Canadian doctors' homes.

6. The question of preference as to sex, age, religion, etc., will of course be observed and it will remain, in the last analysis, for the foster home to accept or reject, as the case may be.

7. At present there is no indication as to whether or not funds will be released from Britain to pay for the maintenance of any of these children in Canada. Therefore, they must still be regarded as non-paying guests. This provision, of course, is open to change at the discretion of the respective Governments, but it would be wiser at this juncture to look upon the service as a voluntary one.

8. At this time I am able to report that information reaching me from three of the nine provinces indicates that medical homes in these provinces are ready to receive more than 1,100 British doctors' children. Accordingly, I am cabling the British Medical Association to this effect and suggesting that all arrangements with respect to sending their children to Canada must be made through the proper authorities in England, but that they may rest assured that, when the children arrive here, homes for the number of children designated will be available. It would, therefore, seem proper for each Division in the Association to take the following steps:

(*a*) Contact the medical profession of the Division to ascertain their wishes with regard to the acceptance of children.

(*b*) Notify the proper provincial authorities of the homes offered—giving names and addresses or advise doctors offering homes to contact the local welfare office.

(*c*) Advise the doctors offering their homes that all further negotiations leading to the placing of children in their homes will be carried on between the governmental agency and the doctor.

9. It would seem desirable that each Division keep this office notified of the developments within the province,—*i.e.*, as to the number of doctors' children the province will absorb,—in order that the details may be communicated from time to time to the British Medical Association.

10. Furthermore, it would seem proper, depending upon the extent to which advantage is taken of our hospitality, that the Divisions should organize either provincial or local medical advisory committees which would be responsible for taking a corporate interest in these doctors' children, depending upon the needs which might develop. I am thinking of such things as special attention, recreation or holiday privileges and matters of a like nature which will occur to our profession.

11. I would suggest that as soon as possible after receipt of this letter, you contact your provincial authorities—

(*a*) to enter into the necessary arrangements in your province for the reception of these children; and

(*b*) to confirm the understanding which I have presented in this letter which, while emanating from the Ontario Government, I am given to understand is in the main applicable to all the other provinces.

T. C. ROUTLEY,
General Secretary.

Hospital Service Department Notes

Problems of Smaller Hospitals

During the past year a special committee of the Ontario Medical Association made a study of the problems of the staffs of smaller hospitals. This committee, under the chairmanship of Dr. R. P. I. Dougall, of Petrolia, was made up of representatives of four counties, all of which were associated with the staffs of smaller hospitals. The facilities of 31 hospitals having less than 50 beds capacity were studied. Some interesting data were obtained.

It was gratifying to note the fairly satisfactory equipment of these hospitals. Practically all have x-ray facilities, two-fifths have fracture tables, one-third have an adequate supply of splints, and in two-thirds the bed accommodation was satisfactory. Of the 26 hospitals reporting on the nursing service 18 employ graduates only; of the 8 schools for nurses 3 were approved and 5 were unapproved. The question is asked, Has the discouragement of training schools in smaller

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, 184 College Street, Toronto.

hospitals fostered the development of unapproved schools and, if so, what effect will this tendency have upon the standard of nursing service in the districts concerned? Only one-fifth of the hospitals had qualified dietitians, the average salary being $50 per month (plus maintenance, we presume). The employment of stenographers for history taking was not, in the great majority of cases, considered a practicable plan. As most of the replies were furnished by secretaries of hospital boards and nurse superintendents, this observation was hardly based upon full knowledge, as the use of properly trained medical stenographers has proved very satisfactory, and is certainly better than the present situation prevailing in small hospitals where the records are usually exceedingly sketchy, if written at all.

One-third of the hospitals reporting have no organized staff. In half of this group no supervision is exercised to protect the interests of the hospital or the patient. The Committee recommends that steps be taken to ensure either the enforcement, or preferably the revision, of existing regulations governing the staffs of smaller hospitals. In two-thirds of the hospitals medical men attend their own staff patients exclusively. This lays an additional load upon the practitioner rendering gratuitous services. A study of the gratuitous work rendered in 15 hospitals last year revealed that, on the Ontario Medical Association tariff basis, the medical staffs of such hospitals provided $92,725 of free service, or an average of $760 for each doctor. All returns favoured remuneration for staff services. This should be provided by the municipality and the province. Using certain township and town statistics submitted in the case of two hospitals, it was estimated that the cost of providing such remuneration on a basis of 50 per cent of the Ontario Medical Association tariff would be 14.4 cents per capita of population.

The Committee further recommends that the admission of staff patients be the responsibility of a permanently appointed non-political official; that staff cases be treated only by the members of an organized staff, as the practice of doctors treating their own cases only is economically unsound and tends to undermine the integrity of staff organization; that the formation or continuation of unapproved training schools for nurses be discouraged; that members of the medical staff strive to develop closer co-operation with hospital boards and that extraordinary clinical activities of nurses be restricted to the taking of blood pressures, blood counts and x-ray work, and those of orderlies be determined by the local staff. This last recommendation is at variance with that of the Canadian Hospital Council, which is of the opinion that, in the absence of interns, a specially trained graduate nurse could perform many of the clinical tasks which now cannot be done as fully as conditions would warrant owing to the absence of medical help in many hospitals. This excellent report contains much valuable information and indicates a very commendable effort on the part of the medical staffs of smaller hospitals to work out these problems.

Medical Societies

The British Columbia Medical Association

The Annual Meeting of the British Columbia Medical Association, to be held at Nelson in September, is rapidly taking form. An imposing list of speakers is to attend, including the following: Dr. Duncan Graham, Professor of Medicine, University of Toronto, President, Canadian Medical Association; Dr. George H. Anderson (Medicine), Spokane, Washington; Dr. J. Harold Couch, Department of Surgery, University of Toronto; Dr. Stuart W. Harrington, Rochester, Professor of Surgery, Mayo Foundation; Dr. J. W. Lynch (Surgery), Spokane, Washington; Dr. Walter de M. Scriver, Montreal, Lecturer in Medicine, McGill University; Dr. Albert M. Snell, Rochester, Professor of Medicine, Mayo Foundation; Dr. Harold W. Wookey, Toronto, Department of Surgery, University of Toronto; and Dr. T. C. Routley, General Secretary, Canadian Medical Association.

Dr. M. W. Thomas, Secretary of the Association, is extremely busy at present, and a very successful meeting is assured.

The London Academy of Medicine

The following is a list of the Executive of the London Academy of Medicine for 1940-41: *President* — Dr. G. R. Collyer, 183 Wortley Road; *First Vice-president*—Dr. W. S. Johnston, 232 Queen's Avenue; *Second Vice-president*—Dr. J. H. Fisher, Medical School, Ottaway Avenue; *Secretary*—Dr. C. A. Cline, Jr., 325 Queen's Avenue; *Treasurer*—Dr. W. T. Haslett, 845½ Hellmuth Avenue.

C. A. CLINE, JR.,
Secretary.

The Toronto Academy of Medicine

Officers and members of council of the Toronto Academy of Medicine were elected as follows at the thirty-third annual meeting held in Toronto on June 18, 1940. *President*—Dr. William Magner; *Vice-president*—Dr. Charles J. Copp; *Hon. Secretary* — Dr. E. W. Mitchell; *Hon. Treasurer*—Dr. James W. Ross. *Elective Members of Council* (two-year period)—Drs. William Boyd, W. A. Burr, C. E. Cooper Cole, G. J. Gillam, Jas. Simpson, E. G. Wheler; (one-year period)—Dr. R. M. Janes.

The following were elected chairmen of sections—Medicine, Dr. Angus MacKay; surgery, Dr. Spence Reid; pathology, Dr. Gordon

Cameron; ophthalmology, Dr. W. T. Gratton; oto-laryngology, Dr. Gregor McGregor; preventive medicine and hygiene, Dr. D. S. Puffer; pædiatrics, Dr. L. Nelles Silverthorne; obstetrics and gynæcology, Dr. W. H. Murby; anæsthesia, Dr. C. G. Bryan; neurology and psychiatry, Dr. Eric Linell; urology, Dr. Robin Pearse.

The Western Nova Scotia Medical Society

The Western Nova Scotia Medical Society, in annual meeting, elected the following: *President*—Dr. P. E. Belliveau, Meteghan; *Vice-presidents*—Dr. J. A. Donahue, Shelburne Co., Dr. R. M. Caldwell, Yarmouth Co., Dr. E. A. Brasset, Digby Co.; *Secretary-Treasurer* — Dr. Thomas A. Lebbetter, Yarmouth; *Members to the Executive of the Nova Scotia Medical Society*—Dr. G. V. Burton, Yarmouth, Dr. L. P. Churchill, Shelburne.

Post-Graduate Courses

The Southern Saskatchewan Summer School

The Southern Saskatchewan Medical and Surgical Summer School sponsored by the Regina and District Medical Society was held June 12th and 13th at the Regina General and Grey Nuns' Hospitals, with the following program.

General Hospital.—Morning: Surgical motion pictures; "The use of the newer drugs in treatment", Dr. Lennox G. Bell, University of Manitoba, Winnipeg; "Five year review of prostatic surgery", (Regina General Hospital) Dr. W. A. Dakin, Regina; "The obstetrical significance of intra-cranial injury of the newborn, (based on a study of 255 autopsies of stillborns)", Dr. F. G. McGuiness, University of Manitoba, Winnipeg; "Acrodynia", Dr. U. J. Gareau, Regina; "The use and abuse of the x-ray", Dr. L. C. Hacking, radiologist, Regina General Hospital; Col. W. A. Jones, R.C.A.M.C., Ottawa, was the guest speaker at the luncheon. He spoke on "The medical profession and the war".

Afternoon: "Some thoughts regarding the x-ray survey of chests of the defence forces of Canada", Col. W. A. Jones, R.C.A.M.C., Ottawa; "The practical use of hormone products in modern therapy", Dr. Lennox G. Bell, University of Manitoba, Winnipeg; "The treatment of posterior positions of the occiput", Dr. F. G. McGuinness, University of Manitoba, Winnipeg; "Specific control of infectious diseases", Dr. Geo. R. Walton, Medical Health Officer, Regina.

Major M. A. McPherson, K.C., was the guest speaker at the dinner which was given under the auspices of the Regina and District Medical Society.

June 13th, Regina General Hospital.—Morning: "Common external diseases of the eye and their treatment", Dr. D. T. Martin, Regina; "Common fallacies in the diagnosis of cardio-vascular disease", Dr. E. P. Scarlett, Calgary Associate Clinic, Calgary; "The diagnosis and treatment of pollinosis", Dr. R. V. Ellis, University of Minnesota, Minn.; "Metrazol shock therapy in mental disease", Dr. O. E. Rothwell, Regina; Surgical motion pictures. Rev. Harry Joyce was the guest speaker at the luncheon at the Grey Nuns' Hospital.

Grey Nuns' Hospital.—Afternoon: "Allergic pneumonia", Dr. R. V. Ellis, University of Minnesota; "Tumours of the bone", Dr. A. W. Blair, Regina; Presentation of Clinical Cases, Dr. M. G. Israels, Regina.

The visiting doctors were given an opportunity to inspect the new cancer clinic wing at the Grey Nuns' Hospital.

LILLIAN A. CHASE.

Post-graduate Course on Traumatic Surgery

The University of Toronto, Faculty of Medicine, offers to graduates a course of one week, commencing Monday, September 23, 1940, on Traumatic Surgery.

The course will commence at 11 a.m. Monday, at the Toronto General Hospital, and will continue, morning and afternoon, till Saturday noon, September 28th. It will be made as practical as possible, and an attempt will be made to have the students take part in all demonstrations.

The course will be limited to twenty-five.

Full particulars will be sent on application to the Secretary, Faculty of Medicine, University of Toronto, at whose office registration will take place. A fee of $25.00 will be charged. In making application, please state: (*a*) date of graduation; (*b*) what school; (*c*) training since graduation.

University Notes

University of Manitoba

At the annual convocation of the University of Manitoba on May 15th the degree of M.D. was conferred on forty-five young men and women. The University Gold Medal in Medicine, the Manitoba Medical Association Gold Medal for highest standing in the first four years of the course, the Dr. Charlotte W. Ross Gold Medal for highest standing in Obstetrics during the course, and the Chown Prize in Medicine (gold medal and $50.00) were awarded to Beatty Haig Ramsay. The Chown Prize in Surgery (gold medal and $50.00) was awarded to William James Hart.

The Prowse Prize for Research in Medicine (bronze medal and $250.00) went to Dr. Sara

Dubo for her work on Chloride Metabolism in Tuberculosis. She will continue her work in the same subject during the next year under a grant from the Dominion Research Council.

The Physiological Research Prize (bronze medal and $10.00) was awarded to David Bradshaw Stewart.

McGill University

The Annual Convocation of McGill University was held on May 30, 1940, in the grounds of the University.

This was the first year in which two groups of medical students, the regular and those taking what may be called an intensive, compressed and shortened course, received the M.D., C.M. degrees. There were 76 graduating under the old curriculum and 86 under the new—162 in all. The prize winners were the following:—

Old Curriculum.—Douglas G. Cameron, Swift Current, Sask., The Wood Gold Medal for the best Clinical Examinations in the subjects of the Final Year; the Alexander D. Stewart Memorial Prize for the Highest General Qualifications for the Practice of Medicine. Elizabeth N. MacKay, Westmount, Que., the Holmes Gold Medal for the Highest Aggregate in all subjects forming the Medical Curriculum; the Robert Forsyth Prize for High Standing in Surgery; the Lieutenant-Governor's Silver Medal for the Highest Standing in Public Health and Preventive Medicine.

New Curriculum.—L. Parker Chesney, Westmount, Que., the Lieutenant-Governor's Silver Medal for the Highest Standing in Public Health and Preventive Medicine. Simon Gold, Montreal, Que., the Campbell Howard Prize in Clinical Medicine. Charles B. Ripstein, Westmount, Que., the Holmes Gold Medal for the Highest Aggregate in all subjects forming the Medical Curriculum; the Robert Forsyth Prize for High standing in Surgery; the J. Francis Williams Fellowship in Medicine and Clinical Medicine. Lea C. Steeves, Moncton, N.B., the Alexander D. Stewart Memorial Prize for the Highest General Qualifications for the Practice of Medicine. O. Harold Warwick, Saint John, N.B., the Wood Gold Medal for the Best Clinical Examinations in the subjects of the Final Year.

University of Toronto

Medals, prizes, fellowships, scholarships and bursaries awarded by the Senate of the University, Faculty of Medicine.

Sixth Year.—The Faculty Gold Medal, G. A Lane; the Faculty Silver Medal, H. Snitman; the Faculty Silver Medal, T. A. Fraser, M.A.; the Ellen Mickle Fellowship, T. A. Fraser, M.A.; the Chappell Prize in Clinical Medicine, F. W. B. Hurlburt, B.Sc.; the William John Hendry Memorial Scholarship in Obstetrics and Gynæcology, N. Littner, B.A.; the Ontario Medical Association Prize in Preventive Medicine, N. Littner, B.A.; the David Dunlap Memorial Scholarship, A. G. Tellson.

Graduate Awards.—The Reeve Prize, H. V. Rice, M.D.; the Starr Gold Medal, P. H. Greey, M.D., B.Sc.; the Alexander McPhedran Research Fellowship in Clinical Medicine, W. F. Greenwood, B.A., M.D.; the George Brown Memorial Scholarship in Medical Science, J. P. Fletcher M.A., M.D.; the George Armstrong Peters Prize, E. H. Botterell, M.D.(Man.), M.S.(Tor.); the Faulkner Medal in Psychiatry, 1938-1939, D. R. Easton, M.D., F.R.C.S.(C), D.Psych.; the Faulkner Medal in Psychiatry, 1939-1940, B. H. McNeel, B.A., M.D., D.Psych.; the Lister Prize in Surgery, A. D. McLachlin, M.D., M.Sc.(West.), D.Phil.(Oxon.), M.S.(Tor.).

University of Western Ontario

At the convocation held on June 5th, the degree of M.D. was conferred on the following 30 candidates: N. A. Alewick, B. C. Brown, E. L. Brown, D. R. Campbell, C. Delitsky, R. Diamond, M. Finkelstein, J. D. Galloway, M. Golden, J. E. Gompf, A. M. Johnson, H. A. Kester, J. Levine, P. P. Luria, J. D. McInnes, J. A. McLachlin, J. F. Mullins, A. A. Nareff, W. L. Needham, J. Priver, A. T. Roos, F. G. Ruston, B. J. Schumm, H. Shapiro, K. D. Symington, W. N. Walters, E. Webb, I. I. Weintraub, R. A. Young and L. Zankan.

The degree of Master of Science was conferred on H. L. Williams.

Prizes and scholarships were awarded as follows:—The J. B. Campbell Memorial Scholarships, (*a*) Medicine, E. L. Brown, (*b*) Physiology, W. Tillman; the Alpha Kappa Kappa Gold Medal, E. L. Brown; the Khaki University and Y.M.C.A. Scholarship, H. L. Fachnie; the Class of 1917 Scholarship, M. Finkelstein; the Roche Scholarship, E. L. Brown (by reversion to A. M. Johnson); the Rowntree Prizes in Medical History, 1st R. Diamond, 2nd L. C. Bartlett, 3rd F. G. Ruston; the W. H. McGuffin Scholarship in Radiology, W. E. Pace; the Ontario Medical Association Scholarship in Preventive Medicine, J. G. Stapleton; the Essex County Alumni Association Prize in Obstetrics, J. A. Chikovsky; the B. T. McGhie Prize in Psychiatry, S. R. Korey; the Reckitts' (over-sea) Prize in Obstetrics, J. D. Galloway; the B'Nai Brith Scholarship in Pathology, M. J. Nareff; the Medical Alumni Gold Medal, E. L. Brown.

In youth acquire that which may requite you for the deprivations of old age; and if you are mindful that old age has wisdom for its food, you will so exert yourself in youth that your old age will not lack sustenance.—Leonardo da Vinci.

Letters, Notes and Queries

The Five-Day Treatment of Syphilis

To the Editor:

I had the pleasure of attending the conference on the massive five-day treatment of syphilis, held in New York, about seven weeks ago.

There is no doubt that this method of therapy marks the greatest advance in the treatment of syphilis since the original arsphenamine was discovered by Ehrlich. The method, in general, consists of giving from 600 to 1,200 mg. of mapharsen, dissolved and suitably diluted with water, for a ten-hour period daily for five days. Approximately 280 mg. of mapharsen are given in each ten-hour period. The apparatus and method used are modified from the Murphy drip technique.

The theoretical justification for this massive therapy procedure is entirely compatible with that for the sulfanilamide group. The object of this treatment is to raise the blood and tissue arsenic levels to a point at which the spirochæte can no longer live. These levels, as measured, are many times higher than those found when conventional standard therapy is used, and the high level is sustained in the tissues for a period of approximately four days.

There are several disadvantages to this form of therapy and the most obvious of these is a tendency to produce reactions. When neoarsphenamine was used approximately one patient in three developed polyneuritis. In addition, there was a high percentage of toxic erythema, fever and reactions referable to the gastro-intestinal tract. Since mapharsen has been substituted for neoarsphenamine, the incidence of the reactions has markedly diminished, but with mapharsen, as with neoarsphenamine, there have been several cases of hæmorrhagic encephalitis, with two deaths to date, and at least four others, in a total of some three hundred patients. This number is about five times as high as that expected with conventional therapy and precautionary measures have been of no avail to date. Obviously this method should not be put in the hands of the general practitioner, nor should he be informed of the details of the technique in a general medical journal. With the unfortunate popularization that the method has already had in the newspapers some of these would-be syphilologists would invariably attempt such therapy, almost inevitably with disastrous results.

The second great objection to this method of therapy is, that it is new. The five, ten and twenty year results have not, as yet, been ascertained.

Any clinic wishing to do experimental work with this method should be adequately equipped; first with directly controlled hospital beds, and the nursing service should be uniform with permanent assignments; and, secondly, with adequate facilities for follow-up for a minimum five-year period. The follow-up should include a clinical, laboratory and serological check-up, and by that is meant, liver and kidney investigation, as well as the more routine fluoroscopy examination and examination of the spinal fluid at six months, one and five years after the treatment has been given.

FRANK E. CORMIA

Montreal,
June 19, 1940.

Answers to letters appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

Cortical Hormones in Traumatic Shock

To the Editor:

In your editorial in the July number written by myself I stated that "Weil and his coworkers using Selye and Schenker biological assay for determining the presence of cortin demonstrated that human patients suffering from shock excreted considerable amounts of cortin in their urine." Dr. Meakins has since kindly drawn my attention to the fact that this statement is somewhat erroneous and should read "Weil and Browne showed that in human patients after surgical interventions, injuries, acute infections, etc., the cortin excretion in the urine is greatly increased."

I would be obliged if you would publish this correction.

C. P. MARTIN,
Professor of Anatomy,
McGill University.

Montreal, Que.,
July 14, 1940.

English Doctors' Children as Canadian War Guests

To the Editor:

As a Canadian doctor, temporarily working in Great Britain, I have had an opportunity of observing the worry and anxiety that the doctors in this country have with regard to the safety of their children during the air-raids we are now having. This anxiety is now intensified by the threat of imminent invasion of this island.

Because of the close association and friendship between the British and Canadian Associations, I think that it would be a splendid gesture for the Canadian doctors to offer the hospitality of their homes to the children of doctors in the Old Country. I understand that a similar arrangement is being made by the Canadian legal profession with their colleagues in Great Britain, which is much appreciated over here.

I am sure that it would mean a lot to the medical men in this country to know that their children were safe in the homes of their colleagues in the Dominion, and I am certain that there would be a splendid response from the

Canadian medical profession if the matter were put to them.

WILFRED I. B. STRINGER,
Deputy Medical Superintendent,
The County Hospital.

Chatham, Kent, Eng.
July 2, 1940.

Abstracts from Current Literature

Surgery

Importance of Simple Ulcer of the Right Side of the Colon in Diagnosis of Abdominal Disease. Harrison, H.: *Arch. Surg.*, 1940, **40**: 959.

The author reports 6 instances of the relatively rare lesion of simple ulceration of the cæcum or ascending colon, and emphasizes the seriousness of the condition and the difficulty of diagnosis as well as the complications. This series is from the Peter Bent Brigham Hospital, Boston. A correct diagnosis was not made in any of the patients. The cause of this simple ulcer is not known. It usually occurs on the mesial aspect of the cæcum a few centimetres beyond the ileocæcal valve. The relatively poor blood supply in this region may be a factor. Microscopical examination leaves the nature of the ulcer as much a mystery as does mere inspection. The edges of the ulcer are rather sharp and there is usually a small amount of connective-tissue reaction. The intestinal wall at the base is thinned even in the absence of perforation. The clinical features are not clearly defined. There is usually a history of constipation with occasional melæna in uncomplicated cases. There may be vague dull pain in the lower right abdomen but not sufficiently characteristic to be of diagnostic value. Acute perforation is the most frequent and most dangerous complication and occurred in 4 of the 6 patients in Harrison's series. Prompt operative measures for closure of the perforation should be instituted.

G. E. LEARMONTH

Chondromalacia Patellæ. Karlson, S.: *Acta Chirurg. Scand.*, 1939, **83**: 347.

Karlson reports on 62 operated on and re-examined cases. A history of trauma was obtained in 58 per cent, and, although the possibility of trauma could not be ruled out in the remainder, he is willing to concede there may be a pre-disposing congenital factor. He did not investigate the hereditary anamnesis. Three phases are agreed upon, chondral rupture (pressure-tenderness), cartilaginous crepitations, and the third (stiffness, pains, "jamming", swelling, effusions, and finally rectus femoris atrophy). Conservative measures such as rest, warmth, were used for the first two phases, with arthrotomy and resection of diseased cartilage for the third. Of the 62 operated upon 66 per cent were subjectively improved. Of 71 cases not operated on 10 were free of subjective symptoms.

FRANK DORRANCE

Treatment of Staphylococcus Septicæmia. Longacre, A. B. *et al.*: *Surg. Gyn. & Obst.*, 1940, **70**: 1.

By their more recent technique of administration at the Presbyterian Hospital the authors report a mortality of 28 per cent in the 21 cases treated. In a series of 54 cases not treated with the staphylococcus bacteriophage the mortality was 81 per cent. All foci were opened and drained as soon as discovered, either using the bacteriophage as a moist dressing or instilling it through Carrel-Dakin tubes. The main supportive measure was blood transfusions; they do not attribute any bacteriolytic powers to this treatment. They have enhanced the potency of their autogenous bacteriophage by testing it not only on savita broth but also by attempting to get 4-plus lysis on sheep's blood agar plates. Prior to the preparation of autogenous bacteriophage they begin the doses with one of the stock bacteriophages which they have. The first day's treatment is given hourly in 7 doses, diluted in 10 times the quantity of normal saline, intravenously. A reaction from any one dose calls for a rest period of 8 hours and reversion to the next smaller dose. The dose is gradually increased until 50 c.c. are given daily. In several cases primary massive doses have been given; in others the daily dose has been as great as 270 c.c. Bacteriophage stimulates leucocytosis, acts as an opsonin, and may or may not destroy the bacteria in the blood stream.

FRANK DORRANCE

Obstetrics and Gynæcology

The Control of Cancer in Women from the Medical Standpoint. Watlins, R. E.: *Am. J. Obst. & Gyn.*, 1940, **39**: 394.

Physicians should instruct their women patients to undergo periodic examinations, at which time a careful investigation of the pelvis should not be omitted. Strict attention should be paid to the elimination of chronic inflammatory lesions. The immediate repair of cervical injuries following childbirth should be done when surroundings permit. The postpartum elimination of cervical erosions, endocervitis and infected lacerations is important in the prevention of cancer.

In the experience of a number of leading American gynæcologists the value of the Schiller test is uncertain and doubtful. The colposcope is but little used, owing to the difficulty of interpretation of its findings. At present there is no substitute for strong illu-

mination as an aid to detecting early evidence of a cervical malignant growth. Biopsy and microscopic examination of any suspicious looking lesion should be promptly performed. There is general agreement that when leukoplakia of the cervix is found it should be eradicated.

A more thorough and systematic training of medical students in the early diagnosis and treatment of cancer is advisable. There is need for wider education of women as to the significance of abnormal menstruation and vaginal discharges. Such education of girls of high school age is suggested. ROSS MITCHELL

The Clinical Aspects of Pelvic Endometriosis. Payne, F. P.: *Am. J. Obst. & Gyn.*, 1940, **39**: 373.

Pelvic endometriosis is characterized by the potential multiplicity of its sites of invasion. The majority of the lesions occur in the ovaries and the cul-de-sac, but any of the pelvic structures or the contiguous viscera may be affected. It is a disease of middle and late menstrual life, with an incidence of approximately 80 per cent between the fourth and sixth decades. Additional pelvic disorder accompanies endometriosis in four-fifths of the cases, to obscure its presence and to cloud the diagnostic picture.

The chief symptoms of endometriosis are local pain, alterations in the menstrual and reproductive processes, and dysfunction of the adjacent organs. The treatment, which may be that of routine observation, surgical intervention, or irradiation, depends upon the severity of the symptoms, the patient's age, and the removability of the major lesions.

Conservatism, particularly in young patients, with preservation of ovarian and, if possible, menstrual and procreative functions, is justified by the results; 90 to 95 per cent complete or partial relief of symptoms, 8 per cent necessity for further treatment and 9 per cent subsequent pregnancies. ROSS MITCHELL

Studies in Vaginal Fluid. Lissmore, N. and Currie, D. W.: *J. Obst. & Gyn. of the Brit. Emp.*, 1939, **46**: 673.

A series of 105 cases of vaginal discharge is examined. The technique of the examination of the patient, the removal and examination of the fluid are described.

A small proportion of the cases, 5.7 per cent, shows no qualitative vaginal fluid abnormality. Two explanations of this are offered.

The majority of the cases, 66.9 per cent, are hosts of trichomonas vaginalis. The trichomonas vaginalis is not pyogenic but is associated with a lowering of the normally high acidity of the vaginal contents, and the removal of one of the most powerful barriers to infection by pyogenic invaders, of which the *Staph. pyog. aureus* is by far the commonest in their series. This accounts for the frequent association of the flagellate with pus, secondary infection being more usually present. In their view there are two possible explanations of this association of the flagellate with decreased activity.

1. The trichomonas is antagonistic to the bacillus of Döderlein. It also impedes the normal desquamation of vaginal epithelium. Thus both factors associated with normal vaginal acidity, namely, bacillus of Döderlein and glycogen, are reduced or absent.

2. The acidity of the vagina suffers great antecedent reduction by at least two natural factors, namely (*a*) the advent and menstrual lochia during periods, and (*b*) the deposition of semen during intercourse. The trichomonas, finding once again a medium of a pH agreeable to its existence, readily re-establishes itself. It is thus not necessary to postulate direct infection from the male during intercourse. Either of these two factors would explain the reappearance of trichomonas after apparent cure.

In the 33.1 per cent of cases in which trichomonas is absent pyogenic infection explains the qualitative abnormalities of the vaginal fluid, and, as in the trichomonas positive cases, the *Staph. pyog. aureus* appears to be the commonest invader.

Absence of symbiosis of the bacillus of Döderlein with pyogenic bacteria is also observed, but in a lessened degree than in the trichomonas positive cases. Similarly, vaginal epithelial desquamation is less impeded than by trichomonas vaginalis, the glycogen content less diminished. As a result there is not so great a lowering of the vaginal acidity from normal.

P. J. KEARNS

Orthopædics

Surgical Approach in Supracondylar "T" Fractures of the Humerus Requiring Open Reduction. Van Gorder, G-J.: *Bone & Joint Surg.*, 1940, **22**: 278.

The author describes an excellent surgical approach to the posterior aspect of the lower end of the humerus and elbow joint. With the patient prone and the limb on an arm support, the elbow at a right angle, a mid-line incision extending 5 inches above and 1 inch below the tip of the olecranon is made. The triceps fascia is cut in tongue-shaped fashion with the base distally, and the triceps is cut through in oblique fashion of the same shape, to remain attached at the base of the flap at the olecranon. The ulnar nerve is carefully isolated and protected. The area required is thus adequately exposed and the anatomical structure readily restored by suture. Eight cases so treated are detailed, with perfect results in 5 cases. The results in two cases could have been avoided with proper care. H. F. MOSELEY

Oto-rhino-laryngology

Disorders of the Mouth of the Œsophagus in the Syndrome of Plummer-Vinson. Gerlings, P. G.: *J. Laryn. & Otol.*, 1940, **55**: 143.

Most cases of Plummer-Vinson's syndrome come to the laryngologist first because of dysphagia. Discomfort appears always at the level of the larynx, and the only nourishment possible is soft food and liquids. The patients generally have a small mouth with fissures, lack of teeth, glossy tongue and a hypochromic anæmia. Six cases are discussed in detail, including x-ray findings. By means of x-ray and œsophagoscope examinations the cases are divided into four groups: (1) stagnation of barium in the vallecula glosso-epiglottica and sinus pyriformis; (2) stagnation of barium just above the mouth of the œsophagus; (3) spastic stricture just below the mouth of the œsophagus; (4) cicatricial stenosis of the œsophagus. All groups are relieved by iron. Bougies or the œsophagoscope will relieve groups 2, 3, and 4. All Plummer-Vinson cases should be x-rayed and œsophagoscoped, to eliminate possible tumours of the œsophagus and to remove dysphagia as quickly as possible. Unrecognized cases of this syndrome go on to carcinoma at times. G. H. FISK

The Formation of Passavant's Bar. Townshend, R. H.: *J. Laryn. & Otol.*, 1940, **55**: 154.

Passavant in 1869 described a cross roll or ridge which appeared on the posterior pharyngeal wall during articulation in a subject with a cleft palate. Wardhill and Whillis described and named the muscle fibres causing this ridge the palato-pharyngeal sphincter. Sappey also described a distinct muscle, the occipito-staphyline, as causing this ridge. There are now three schools of thought: (1) that the superior pharyngeal constrictor has no palatine origin; (2) that the palatine origin of the superior constrictor is an exceptional condition; (3) that there is a band of fibres constantly arising either from the palatine aponeurosis or from the reflected tendon of the tensor palati. These opinions may be found in the standard anatomical texts some of which change their opinions with every edition.

The anatomical observations of the author were made on living subjects and by dissection of the cadaver. From a living case of cleft palate he proves the continuity of Passavant's bar with the remnants of the palate body. From radiograms of living subjects he establishes the following facts. A slight curve at the level of the arch of the atlas is the only evidence of the presence of Passavant's bar in the normal subject. In cleft palate a large shadow is visible coming forwards from the posterior wall of the pharynx, to touch the upper and back part of an obturator. It is situated some way above the level of the arch of the atlas. From dissection the author states the following conditions were found to be present. A fascial plane may exist between the most anterior parts of the palato-pharyngeus and the superior constrictor. Muscle fibres are always present passing transversely round the pharynx and arising from the palatine aponeurosis. These are continuous with the fibres of the muscular coat of the pharynx and the palato-pharyngeus muscle. Muscle fibres have a continuous line of origin from the palate, pterygoid hamulus and pterygo-mandibular ligament. From these observations it is concluded that Passavant's bar is formed by the contraction of muscle fibres that run round the pharynx from the palate in a horizontal direction. These are a part of the palato-pharyngeus muscle and blend posteriorly with the superior constrictor very soon after arising from the palate. A fascial plane may be present between the upper and anterior parts of the superior constrictor and the palato-pharyngeus as a developmental reversion to a primitive condition. G. H. FISK

Therapeutics

Section of the Descending Spinal Root of the Fifth Cranial Nerve. Grant, F. C., Groff, R. A. and Lewy, F. H.: *Arch. Neurol. & Psychiat.*, 1940, **43**: 498.

One of the chief objections to section of the posterior root of the fifth cranial nerve for relief of tic douloureux and facial pain from malignant growth is persistent burning paræsthesia, which appears in the anæsthetic area in about 3 per cent of patients. This disadvantage is overcome by the technique introduced by Sjöquist in 1937, which consists in sectioning the bulbospinal root of the fifth cranial nerve. Grant and his associates report their experiences with twelve such operations. The operation is practical from a technical standpoint. A unilateral exposure of the posterior fossa is made, the dura opened, the cisterna magna drained, and the tonsil of the cerebellum retracted upward to expose the vagus roots as they emerge from the medulla oblongata. The site for the section of the bulbospinal root is relatively superficial. The posterior inferior cerebellar artery is the only vessel which may have to be displaced. The vagus nerve is the landmark for the section, which is made on a level with the last caudal filament of this nerve. Providing that the operation is done carefully and according to the specifications outlined by Sjöquist there are no serious complications. Pain and thermal sensations are abolished without loss of touch sensation. Because of this, patients are better able to chew their food, without biting the tongue or lip. Subjective numbness is absent. In all instances the motor root is preserved. The procedure is ideal for patients with malignant tumours of the face,

since the exposure permits one to section the ninth cranial nerve as well as the upper cervical roots. FRANK TURNBULL

The Duration of Remission in Pernicious Anæmia with Liver Therapy. (The Efficacy of Massive Doses Administered at One Time). Strauss, M. B. and Pohle, F. J.: *J. Am. M. Ass.*, 1940, **114**: 1318.

Patients with pernicious anæmia who require relatively little liver extract to maintain a normal blood level may relapse in as short a time as two months after liver therapy is omitted. The majority of patients with pernicious anæmia cannot be satisfactorily treated by the use of massive doses of liver extract given at intervals of several months. The authors also conclude that the optimum interval between injections for most patients is from one to four weeks.

The authors point out also that several patients did not relapse for 1 to 2 years after liver therapy was omitted and that one might erroneously conclude that it was the treatment which kept such patients at a satisfactory blood level during this remission if a certain dosage of liver extract had been maintained. For this and other reasons they feel that any attempt to determine the potency of liver extract by its effect in maintaining satisfactory erythrocyte levels might lead to extremely erroneous conclusions. S. R. TOWNSEND

Pathology and Experimental Medicine

The Pathology of Acute Yellow Atrophy and Delayed Chloroform Poisoning. Sheehan, H. L.: *J. Obst. & Gyn. of the Brit. Emp.*, 1940, **47**: 49.

A pregnant woman in normal health appears to be normally resistant to liver damage by chloroform. This anæsthetic has been used without trouble in an enormous number of deliveries during the last century. Among the series of livers from obstetric patients examined histologically in this study there were very many from patients who died from unrelated complications during the puerperium after delivery under chloroform. When the patient was in normal health before the chloroform was given the liver never showed any histological abnormality, apart from the two cases noted with isolated cellular lesions due to excessively prolonged administration.

Delayed chloroform poisoning is almost entirely confined to patients who have a gross metabolic disturbance before the administration of the anæsthetic. From the differences in the histological types of lesion it appears probable that there are corresponding differences in the metabolic disturbances in hyperemesis and dystocia. Nevertheless, the factor of a starvation acidosis appears to be common to all cases; it is the most easily obviated, and can be most easily treated. P. J. KEARNS

Observations on the Plasma Prothrombin and the Effects of Vitamin K in Patients with Liver or Biliary Tract Disease. Pohle, F. J. and Stewart, J. K.: *J. Clin. Investigation*, 1940, **19**: 365.

In 136 consecutive cases of liver and biliary tract disease the incidence of a reduction in plasma prothrombin below normal was 47 per cent. Intrinsic liver disease was a frequent cause of the prothrombin deficiency.

A marked reduction of the plasma prothrombin was present in each of 10 persons who exhibited abnormal bleeding. The data suggest that hæmorrhage should be anticipated when the prothrombin concentration is 30 per cent or below.

The effect of the oral administration of vitamin K and bile salts on the prothrombin in 46 jaundiced patients with a reduction in this coagulation factor was not uniform. Twenty-eight patients showed a satisfactory increase in prothrombin while 18 showed no improvement.

The failure of vitamin K and bile salts to produce an increase in the prothrombin in certain cases with jaundice is often due to the presence of extensive hepatic damage. The decrease of prothrombin which is not uncommon after surgical intervention in jaundiced patients is especially likely to occur if hepatic damage is present.

The studies suggest that in the absence of obstructive jaundice, external biliary fistula, or an abnormal intestinal absorptive surface, the plasma prothrombin concentration serves as a measure of liver function. S. R. TOWNSEND

Correction of Prothrombin Deficiencies. Andrus, W. D. and Lord, J. W.: *J. Am. M. Ass.*, 1940, **114**: 1336.

From the authors' experience with synthetic vitamin K substitutes in human beings, supplemented with experiments made on animals, the following conclusions were drawn.

1. The intramuscular injection of 2-methyl-1, 4-naphthoquinone dissolved in corn oil is a simple and effective means of restoring the plasma prothrombin level in the absence of severe liver damage.

2. Single injections of as little as 2 mg. of this substance restore the level of plasma prothrombin by as much as 48 per cent, and the effect is evident as early as eight hours after the injection.

3. The effect of a single injection may be prolonged for as long as a week, unless adverse factors such as operation on the biliary tract or other liver damage supervene.

4. No toxic effects were noted after doses as high as 4 mg. had been given, either in patients or in animals. S. R. TOWNSEND

Differential Intrabronchial Pressures and Mediastinal Emphysema. Marcotte, R. J., Phillips, F. J., Adams, W. E. and Livingstone, H.: *J. Thoracic Surg.*, 1940, **9**: 346.

In 11 dogs under morphine sulphate and ether, mediastinal emphysema usually followed subjection to prolonged elevation of intrabronchial pressure. The pressure varied from 6-14 to 80-110 mm. Hg., and the duration from 18 to 75 minutes (usually over ½ hr.). Intrabronchial pressures of 18 mm. Hg. or below seldom, if ever, cause mediastinal emphysema in dogs. In 5 cats considerably less pressure was necessary for the production of emphysema. Without exception, 16 to 20 mm. of Hg. resulted in emphysema. Once the chest has been opened and increased intrabronchial pressure applied, emphysema occurs more easily, as there is then greater stretching of the perivascular tissues with less pressure because of removal of the restraining chest wall. Once emphysema has begun, the pressure necessary for its continued development is somewhat less than that required to initiate it. Intratracheal or positive pressure anæsthesia may result in serious or fatal complications, of which mediastinal emphysema and pneumothorax are very important.

C. C. MACKLIN

Anæsthesia

Anæsthesia for Traumatic and Industrial Surgery. Sankey, B. B. and Russell, K. S.: *Current Res. in Anæs. & Analgesia*, 1940, **19**: 169.

Traumatic and industrial surgical procedures are frequently surgical emergencies, and as such are rushed immediately to the operating theatre with little or no pre-operative preparation. We now are at an advantage in dealing with these cases as we have a wider selection of agents and methods as a result of recent advances in anæsthesia.

From the standpoint of the pre-operative treatment, the presence of shock demands immediate attention. If possible the operation should be delayed until the shock has been treated, as this undoubtedly decreases the anæsthetic and operative mortality. If it is not possible to delay the operation one may treat the shock in the operating room. Intravenous fluid, transfusions, and external heat, together with plenty of oxygen, are easily given throughout the course of the operation. Boothby and Lovelace of the Mayo Clinic have stressed the value of 100 per cent oxygen in the treatment of shock.

The presence of food in the stomach presents a hazard under inhalational anæsthesia. Hence one should postpone the operation if possible under these circumstances. If time does not permit the natural emptying of the stomach, regional or intravenous anæsthesia is to be preferred to inhalational.

Proper pre-medication is a great help in any difficult administration. Morphine and scopolamine in the ratio of 1 part of scopolamine to 25 parts of morphine, given 1½ hours before operation, is a satisfactory procedure.

The choice of the anæsthetic.—Inhalational anæsthetic agents had best be used in association with the intratracheal tube as this assures a free airway at all times. Extra-abdominal operations are best performed under cyclopropane. Intravenous evipal or sodium pentothal are useful especially when fire-proof conditions are desired. These may also be used as a basal anæsthetic with nitrous oxide, permitting the use of a larger proportion of oxygen.

When profound abdominal relaxation is required spinal anæsthesia should be employed. More conservative doses of the spinal anæsthetic agent may be used when combined with a light inhalation anæsthetic. Usually cyclopropane is suitable for this.

Cases with advanced pathological conditions should be given the benefit of the least toxic drug. Some form of regional anæsthetic may often prove useful in this type of patient.

In certain procedures such as the application of body casts or hip spicas where little or no manipulation is required, the production of narcosis with fractional doses of morphine and scopolamine has been very satisfactory.

F. ARTHUR H. WILKINSON

Hygiene and Public Health

Tuberculosis in Medical Students and Young Physicians. Hetherington, H. W. and Israel, H. L.: *Am. J. Hygiene*, 1940, **31**: 45.

This article reports the subsequent history (up to 8 years after graduation) from tuberculosis of 400 physicians, who as medical students at the University of Pennsylvania were examined by x-ray and tuberculin tests. During their student years 71 of these persons were considered to have x-ray evidence of tuberculosis. Four of these were known clinical or arrested cases; 56 were asymptomatic; and 11 had physical signs or symptoms. Three hundred and twenty-five were considered negative on x-ray and 4 were not examined. Three of the negative group subsequently developed clinical tuberculosis; 9 of the x-ray-positive but clinically negative group subsequently developed clinical disease. The reason why only 9 of these 56 positives became clinical cases is attributed to the care they exercised after the x-ray was known to be positive. One death from tuberculosis occurred among the 400 during the 8 years of follow-up.

Tuberculin-testing was done in 317 of the 400 students and only 16 were negative to 1.0 mg. of old tuberculin; 2 of these are known to have developed asymptomatic tuberculosis, and one clinical tuberculosis with positive sputum.

It is recognized that this experience at the University of Pennsylvania is atypical. Other medical schools which have published their results do not show as high an incidence of tuberculin reactors or of disease.

FRANK G. PEDLEY

Tuberculosis in Hospital Personnel. Brahdy, L.: *J. Am. M. Ass.*, 1940, **114**: 102.

The conclusion of this paper is that on the whole medical personnel do not show a higher morbidity and mortality from tuberculosis than do other occupied groups. It is true that tuberculin-negative nurses who are placed under an active case-finding régime do show a high tuberculosis morbidity rate. Probably many of the cases detected by routine x-ray examination would, under another régime, go unrecognized and recover without treatment. The author admits that a student nurse who is tuberculin-negative is more likely to acquire a primary infection during her training than adults in other occupations, but he questions the ultimate significance of this in terms of disability and mortality.

Several of the discussants of this paper took exception to Dr. Brahdy's conclusions. Attention was drawn to the evidence that the rate of infection of nurses is many times as high as in other groups, and that increased morbidity is very likely to be followed by increased disability and mortality. The likelihood of physicians and nurses receiving earlier and better treatment than others was also stressed as a possible factor in keeping down mortality.

FRANK G. PEDLEY

Tuberculosis in Student Nurses. Brahdy, L.: *N.Y. State J. Med.*, 1940, **40**: 326.

It used to be said that nurses did not get tuberculosis. Nowadays that dictum has been reversed and it is generally held that nursing represents a definite occupational hazard of nurses. The author is inclined to be sceptical concerning this. The fact that more tuberculosis is found among nurses may merely mean that the case-finding technique is better. Attention is drawn to the fact, as revealed by mortality statistics, that the highest death rate from tuberculosis among women occurs in the very age-group in which most pupil nurses fall. It would be wrong, therefore, to compare the death rate of student nurses with the general death rate of women. A more correct comparison would be the death rate of student nurses with that of women aged 20 to 25 or 20 to 30. When this is done the available data do not appear to indicate an occupational hazard.

A comparison of the morbidity of nurses from tuberculosis with the morbidity of other groups of women hinges essentially on the comparability of the technique of examination. To compare one group all subjected to an x-ray examination of the chest with a group in which no routine x-ray is used would lead to very fallacious conclusions, since it is well known that tuberculous lesions are demonstrated four or five times as often where routine x-ray is used.

The state of allergy of the nurses on entering is also an important factor. If it is true that pupil nurses come in large part from rural areas, and have a low tuberculin reaction rate, then a higher incidence of primary tuberculosis is to be expected than in a group say of clerical workers mostly recruited from the city. It is believed that few cases of primary tuberculosis have a fatal ending.

Evidence has been accumulating to the effect that there is a higher infection rate (as measured by the tuberculin test) among nurses than among other occupied groups, so that a group of tuberculin-negative nurses may all become positive in a few years. It has been assumed that an increased infection rate implies an increased morbidity rate. The author says in effect that if infection by the tubercle bacillus is inevitable for everyone then the experience in a nursing school is simply one of speeding-up the process. If, on the other hand, infection under modern conditions is not inevitable the nurse to that extent runs a greater hazard.

FRANK G. PEDLEY

Obituaries

Dr. John Gerald FitzGerald, Director of the School of Hygiene and of the Connaught Laboratories, University of Toronto, died in Toronto on June 20th.

Dr. FitzGerald, son of William FitzGerald and Alice Woollatt, was born in Drayton, Ontario, on December 9, 1882. He attended high school at Harriston, Ontario, entered the University of Toronto in 1899, and graduated in medicine with the degree of M.B. in 1903 (M.D., 1920). Being interested in psychiatry, he chose the Buffalo State Hospital for his intern year, and following this he spent a year as clinical assistant in the Sheppard Hospital, Baltimore. Returning to Toronto in 1907, he was appointed pathologist and clinical director of the Toronto Hospital for the Insane and demonstrator in psychiatry at the University of Toronto. The application of clinical laboratory procedures to the problems of psychiatry had a particular appeal for him and led to his spending the following year as a research student at Harvard University. During this time he developed an intense interest in pathology and bacteriology, and in 1909 he was appointed lecturer in bacteriology at the University of Toronto. He continued in this post until 1911, when he was appointed associate professor of bacteriology at the University of California. During the summer of 1910 he carried on studies in the Pasteur Institutes at Paris and Brussels, establishing life-long friendships with Roux, Bordet, and other great leaders. The following summer he engaged in bacteriological studies at the University of Freiburg.

Returing to America, he carried back a vision of what might be accomplished in his home university and country in the practical application of the many ad-

vances in serum and vaccine therapy. In Boston, New York, and Albany there had already been established, under state or city auspices, laboratories for the preparation of essential public health biological products, through the proper use of which the toll of deaths from diphtheria and certain other communicable diseases was being greatly reduced. When the invitation came to him to return to the University of Toronto in 1913 as associate professor of hygiene, he realized that the opportunity which he had so desired was at hand. Through the co-operation of Dr. John A. Amyot, then Professor of Hygiene and Director of the laboratory of the Ontario Board of Health, facilities were afforded him, and within a few months the first anti-rabies vaccine to be prepared in Canada was made available. To the University authorities, Dr. FitzGerald outlined plans which he had originated to further research in hygiene and preventive medicine and to provide that sera and vaccines of value in public health be prepared in Canada, and distributed throughout the Dominion, in such a manner as would ensure their being of high quality and low price. Lest valuable time be lost, he commenced at his own expense the preparation of diphtheria antitoxin. Within a few months the Governors of the University of Toronto undertook responsibility for Dr. FitzGerald's venture, and as at May 1, 1914, his Antitoxin Laboratory became an officially recognized organization within the Department of Hygiene of the Faculty of Medicine of the University, and he was appointed Director of this laboratory. From these small beginnings, and deriving directly from Dr. FitzGerald's vision and leadership, there developed the organization which became known as the Connaught Laboratories in accordance with a provision of a most generous gift which the late Sir Albert Gooderham volunteered in 1915 and completed in 1917, whereby the University of Toronto was presented with a fine farm and splendid laboratory buildings for the use of its antitoxin laboratory.

Early in the Great War of 1914-18, Dr. FitzGerald enlisted in the Canadian Army Medical Corps. Desiring to serve overseas, he transferred to the Royal Army Medical Corps in 1918, as major in command of a mobile laboratory in France. Later he served as assistant advisor in pathology to the Fifth British Army.

On his return from overseas, he was appointed Professor of Hygiene and Preventive Medicine, Faculty of Medicine, University of Toronto. In 1922 he accepted an invitation from the University of California to spend a sabbatical year serving as Professor of Bacteriology and Experimental Pathology during the absence of Professor Frederick Gay, one of his closest friends.

Concurrent with continuous expansion of the work of the Connaught Laboratories, Dr. FitzGerald continued his interest and activity in teaching of both graduates and undergraduates. He constantly promoted the development and improvement of post-graduate courses in public health, realizing that well-trained medical and other public-health personnel are essential in any effort to decrease preventable morbidity and mortality. In 1924 plans were completed for the establishment of a School of Hygiene in the University of Toronto to serve primarily as a national centre for teaching of post-graduate students. Through the generosity of the Rockefeller Foundation, funds were provided for the erection of a building to house this school, and for a substantial endowment. In the new building certain sections of the Connaught Laboratories were accommodated, and Dr. FitzGerald became Director of the school, at the same time continuing as Director of the Connaught Laboratories and as head of the Department of Hygiene and Preventive Medicine, Faculty of Medicine.

In 1932 Dr. FitzGerald was appointed Dean of the Faculty of Medicine, University of Toronto. This was a tribute which was greatly appreciated, marking as it did the recognition by the Faculty and by the University of the important place now occupied by the subjects of hygiene and preventive medicine in university curricula, as well as being an expression of confidence in his ability and leadership. After completing a term of three years as Dean, he continued for a fourth year at the request of the University.

In 1923 he was appointed a member of the International Health Division of the Rockefeller Foundation and continued in this position until 1931, at which time he was named a Scientific Director of the International Health Division. In this capacity he served for two terms of three years. In 1927 he represented Canada at the International Rabies Conference in Paris. He served as a member of the Health Committee of the League of Nations from 1930 to 1936, being vice-president in 1933. He was appointed a member of the Permanent Commission on Biological Standardization of the Health Organization in 1935. He gave his time also to many national, provincial and local organizations. He was a charter member of the Dominion Council of Health, being appointed when the Council was established in 1920. As a member of the Associate Committees on Tuberculosis Research and on Animal Diseases of the National Research Council of Canada, he took an active part in advancing these research studies. He served as a member of the Advisory Council of the Ontario Research Foundation, as a trustee of the Banting Research Foundation, as a member of the committee advisory to the Insulin Committee, University of Toronto, and as a member of the Advisory and Research Committees of the Canadian National Committee for Mental Hygiene. Realizing the importance of strengthening research facilities in every way, Dr. FitzGerald took an active part in the development of plans whereby the National Research Council of Canada would take an important part in promoting medical research, and was appointed a member of the Subcommittee on Medical Research which was organized by the Council in 1938. He was actively associated for many years with the Canadian Medical Association, serving as a member of the executive, of the Council, and on many committees. He served also as a member of the executives of the Canadian Public Health Association and the Canadian Tuberculosis Association, as Honorary Advisor in Public Health Administration to the Department of Health of Ontario, and as Honorary Consultant to the Victorian Order of Nurses. He was honoured by many societies. In 1920 he was elected a Fellow of the Royal Society of Canada; in 1925 he received the degree of LL.D. from Queen's University; and in 1931 he was made a Fellow of the Royal College of Physicians and Surgeons of Canada. He was a Fellow of the Academy of Medicine, Toronto, of the American Public Health Association, and of the American College of Physicians.

Dr. FitzGerald's interests in international public health were most extensive. During the winter of 1933 he made a survey of health conditions in India, Ceylon and Egypt, in association with General F. F. Russell, then Director of the International Health Division of the Rockefeller Foundation, and Dr. W. W. Jameson, Dean of the London School of Hygiene and Tropical Medicine. Recognized as an outstanding authority in the teaching of preventive medicine, he was invited in September, 1936, by the Division of Medical Sciences of the Rockefeller Foundation, to make a survey of the teaching of that subject to medical undergraduates. Together with Dr. C. E. Smith, of Stanford University, he visited the leading medical centres in Canada, the United States, Great Britain and Ireland, and continental Europe, and the findings of their survey were published in a comprehensive report.

The strain of years of intensive work having taken their toll, an illness in 1938 led to it being necessary for Dr. FitzGerald to be relieved temporarily from his active duties in order that he might have an extended period of convalescence and rest. In April of the current year he was able to return home greatly

improved. With him, his many friends and colleagues hoped and expected that he would be able within a few months to resume his work. This, however, was not to be. Instead he had a relapse and suffered a severe collapse followed by four days of acute illness, terminated by his death on June 20th.

He is survived by his widow, Edna May Leonard FitzGerald, a daughter, Mary Leonard FitzGerald (Mrs. Thomas F. Whitley), and a son, John Desmond Leonard FitzGerald. R. D. DEFRIES

AN APPRECIATION

Happy is the man who has episodes to recall of his contact with some unusually interesting fellow passenger on one of the many omnibuses in which we may find ourselves in our journey through life, and fortunate, indeed, is he who has been able to meet such a passenger as Dr. J. G. FitzGerald.

It may not be known to many, that a small group assembled at more or less frequent intervals on a Sunday afternoon in the home of one of us in a certain city. The urge which produced these sessions was the threat of state medicine. A study-program was instituted on the basis of the British Act and also a Bill, prepared by a prominent social worker in the United States. These sessions were interrupted by the declaration of war in 1914, but before they had been temporarily abandoned, the group had been enlarged to include a few from other cities nearby. We soon recognized in Dr. FitzGerald a leader with a driving force who inspired and stimulated all members of the group.

Before he left for service overseas, in another sphere and in association with the young Turks of that day, he again took a leading part in the rejuvenation of the official control and activities of their Academy of Medicine. He took an active part in the preparations for that next annual meeting and with his assistance, the provincial convention was enlarged to include the Provincial Health Officers' Association, the Canadian Public Health Association, and the Canadian Association for the Prevention of Tuberculosis. He, himself, was compelled to leave for overseas before the arrangements were finally completed. But when that Convention was held by those who were left to carry on, the attendance roll-call tripled any previous record.

Dr. FitzGerald continued to foster an interest in organization through committee work and annual business meetings of the provincial body, and he soon graduated to the national field. There again his influence was felt through activities at annual meetings, once as presiding officer of the Council, and in executive groups throughout the year. While it is admitted that a complete organization of our profession was closely related to his broad conception of preventive work in medicine, he always co-operated in all sincerity and supported every endeavour to develop that organization on a thoroughly democratic basis. His keen sense of humour frequently assisted in clarifying difficult situations. His interest and energy in this direction were diverted, only as a result of the increasing responsibilities of his chief life work.

This phase of his life has thus been related with the object of recording the fact that through these activities he developed an intimate and binding friendship with many of those with whom he was associated. Often these friendships spread to take in not only his associates but their families and, in such cases, his friends were able to observe the wide humanity of his non-professional interests. They discovered that he found time in his reading, not only to include the novel of the day, but other cultural literature, classic and modern. Through this habit of life he was able to make interesting contacts with distinguished citizens of world-wide reputation, and he reflected these contacts upon the more humble home folk.

He was an intensely interesting conversationalist at all times, at the dinner table, in our homes and in public places. Some of his friends distinctly recall the occasion twenty years ago, when, during a trip to the West through the Rockies, we had our meals together in the dining-car and listened to his vivid discourse for the benefit of the novices, on the scenes as we passed by. Another memorable association with him was a tour of Saskatchewan six years later, in which he was one of a post-graduate team which met the small-community prairie doctors, widely separated in their practices, but assembled for the occasion at certain centres. The lectures and clinics were nearly always supplemented with round-table group meetings at which the local doctors, like the rest of us, were continuously stimulated to carry on and develop their interest in scientific medicine and in the betterment of service to the public through the life-work of each of them.

In closing, one must recognize that it is impossible to present a complete picture of his life in cold type, but it is hoped that enough has been written to illustrate the driving force through which his successful achievements were attained. We have, perhaps, referred to briefly to his capacity to attach to himself new friends through his many contacts. Here was a man to whom one could go freely in his sorrow, as to a friend who would listen patiently and provide the necessary contribution which made it possible for the individual to readjust his outlook on life and make the needed adaptations. In that, as well as in other ways, the lives of many of us have been enriched by our associations with him on our life journey.

J. HEURNER MULLIN

AN APPRECIATION

Preventive medicine has lost a great leader in the passing of Professor FitzGerald. His organizing ability and fine judgment in choosing promising and able men for his associates and helpers were two of his outstanding qualities, and the loyalty he inspired is shown by the long and devoted service so many of them have rendered. Sensitive and highly strung, but never too robust, he was ambitious to a degree for the ever growing success of the work to which he had devoted his life; but he gave himself too little respite and really became a martyr to his work and to his high ideals regarding it.

My own friendship with Dr. FitzGerald began when I tented with him at Niagara Camp in 1915 and ended only when he left us in this month of June. The close association I had during these intervening years with my old friend "Fitz" will be an abiding and happy memory shared alike by all those who were fortunate enough to have enjoyed the same high privilege. GEO. D. PORTER

Dr. Frederick Gault Finley, of Montreal, died on July 6, 1940. Widely known in the Dominion, Dr. Finley was a member of the medical faculty of McGill from 1889 to 1924, and its Dean in 1921. He was connected for 57 years with the Montreal General Hospital of which he was consultant as well as of the Royal Victoria and the Children's Memorial Hospital, and was chairman of the medical board of the Jewish General Hospital.

In the Great War he served as colonel in the C.A.M.C., from 1914 to 1918 in England and France. He was officer-in-charge of the medical division of No. 1 Canadian General Hospital, and afterward appointed consultant of the Canadian hospitals in England and France. His service won him the C.B. (mil.) in 1918, and he was twice mentioned in the dispatches. He had since been awarded the Jubilee and Coronation medals.

In 1926 when McGill University conferred the honorary degree of LL.D. on Dr. Finley, the late Sir Arthur Currie termed him "a beloved physician, distinguished alike for his achievements in peace and war, a great teacher, a devoted servant of his people, his hospital and his university."

Dr. Finley was a member of the Canadian and the British Medical Associations and of the Association of American Physicians, and he was past-president of the Montreal Medico-Chirurgical Society, and a member of Zeta Psi Fraternity.

An Australian by birth, Dr. Finley was the eldest son of the late Samuel Finley and Emma Gault Finley. Coming to Canada in 1865, he attended the Montreal High School. Afterward he took the degree of M.B. at the University of London, and M.D. and C.M. at McGill University.

He is survived by his wife, formerly Emily Lovell; a son, George S. Finley; a daughter, Margaret Gault Finley; a brother, William Copeland Finley; two sisters, Miss M. L. Finley, of Montreal, and Mrs. F. E. Wright, of Washington, D.C.; and a grandson, Thomas Finley Parker. A son-in-law, Lieut. John Parker, is on active service in England.

An Appreciation

To have come within sight of four score years of age with his eye undimmed and his natural powers not abated; to have gained the respect of the city in which he lived, the high regard of generations of students whom he had taught and patients whom he had cared for, and the strong affection of those who knew him best; to have served his country well through four years of war; to have been actively and usefully engaged in the things which had been his lifelong interest, and to have left all men his friends and no man his enemy—these are the highlights in the life of Dr. Frederick Gault Finley, a prince among men.

At McGill he was a student in the "Golden Age" of the faculty, under such men as Palmer Howard, George Ross, Osler, Roddick and Shepherd. He joined the Montreal General Hospital staff as an intern, later becoming assistant physician, physician, and consulting physician, and he was connected with the hospital in those capacities for 57 years. At McGill he joined the department of anatomy and later the departments of medicine and clinical medicine, in which subjects he was appointed an assistant professor in 1895, in the same year as Dr. H. A. Lafleur who passed away a year ago.

The combination of Finley and Lafleur was for many years a tower of strength to the Montreal General Hospital and to the Faculty of Medicine at McGill. These men, who were trained in the clinical as opposed to the laboratory school of medicine, bridged the gap between the older and the newer outlook upon medicine. They were both of the elastic type of mind, who

> "Are not the first to cast the old aside,
> Nor yet the last by whom the new is tried."

As a teacher Dr. Finley was objective, direct and logical, widely read and discriminating, and the soundness of his conclusions and his good judgment were always evident. Even since his retirement from active hospital duties he was always present at the weekly ward rounds in medicine, and at the pathological conference.

Outside of medicine, his recreations were golf and fishing. Ten days before his death he played 18 holes of golf without fatigue.

Because he was a modest man, he was probably quite unconscious of the place he occupied in the minds and hearts of those whom he taught and who later succeeded him. This regard was more than admiration. It was nearer the veneration which recalls the words: "Know ye not that there is a Prince and a great man fallen this day in Israel?"

A. H. GORDON

An Appreciation

It is difficult to write about an old friend when the loss has come unexpectedly of one who was regarded with affection and gratitude—such was the case of Colonel F. G. Finley, C.B. I had known Dr. Finley for many years. Some of his relatives lived in Saint John and he occasionally visited them. In the early part of the century I made numerous visits to Europe with Dr. G. E. Armstrong and we were sometimes joined by other friends, principally from Montreal. Dr. Finley was with us on one occasion.

In 1914 he joined No. 1 Canadian General Hospital as officer in charge of the Medical Division and proceeded overseas to Salisbury Plains.

In 1915 when at Etaples we spent together over a year under canvas. In one group of three tents there was on one side the late Dr. Kenneth Cameron, officer in charge of the Surgical Division who has recently passed away leaving a fine war record. His writing of the History of No. 1 Canadian General Hospital was a memorable achievement, prepared with great care and success.

On my other side was Dr. Finley. Dr. Finley had an admirable knowledge of his subject with a well-balanced, well-controlled, mind. A bomb did not disturb him; not because of indifference but because of his even temperament. He was ever modest and unostentatious, never obtrusive. His work was done in a quiet thorough way, without fuss.

The unit was proud of Dr. Finley for his knowledge and the gentle spirit and quiet manner which he so fully possessed. These qualities held by one having a firm character and clear views, as Finley had, are not a source of weakness but of strength. It was an important factor in the make-up of the personnel to have this quiet steady influence during stirring and anxious times. He was always fair to his comrades and honourable in all his dealings. It was a natural step in his career to be appointed a consultant to the Canadian Forces.

One understands how it was—the high regard in which he was held by his colleagues in hospital and in university in Montreal. He was invariably a pleasant companion with a philosophic mind and exercised without effort a fine influence. In Dr. Finley's death a blank has been created among my old friends, and the profession has lost a true and honourable gentleman.

MURRAY MACLAREN

Le Docteur P.-C. Dagneau.—Il est des gens qui disparaissent et qu'on regrette parce que leur compagnie était agréable. La famille, l'entourage, les amis pleurent et se souviennent. Il en est d'autres dont la mort ferme une époque, leur époque. Ils avaient vu plus grand qu'eux et leur passage a laissé des œuvres qui ont grandi et pris de l'expansion. On en veut à la mort qui met fin à une vie si prodigue. Le docteur Dagneau emporte avec lui de semblables regrets. Sa vie il l'avait vouée toute entière à l'Université Laval. Ses activités dépassaient le domaine de la Faculté de Médecine.

Il était né à Lévis en 1877. Médecin en 1901, il fait l'internat d'usage à l'Hôtel-Dieu de Québec et part pour l'Europe en 1903. Il va à Paris. Il y apprend les principes et les techniques de l'art chirurgical qu'il illustrera plus tard à Québec.

A son retour, il devient l'assistant, à l'Hôtel-Dieu, du Dr. Michel Ahern à qui il succédera. Il rencontre à cette époque Arthur Rousseau et l'union de ces deux hommes: Rousseau à l'activité débordante, et Dagneau au jugement sûr et pondéré, engendre des œuvres dont une seule suffirait pour créer un monument à eux deux. Ce sont: La réforme des études médicales, la réorganisation de la Faculté de Médecine, la Clinique Roy-Rousseau, l'Hôpital Laval et leur dernier né . . . l'Hôpital du St. Sacrement. A cet hôpital, il avait consacré les 15 dernières années de sa vie. Il lui avait sacrifié sa clientèle, ses loisirs et sa santé. Il le chérissait comme son enfant et craignait tout ce qui pouvait en altérer la constitution ou la bonne réputation.

Calixte Dagneau était un chirurgien de premier ordre. Il n'opérait que quand il était bien sûr de pouvoir rendre service à son malade. Il craignait par dessus tout la maladie chirurgicale, aussi était-il très parcimonieux dans ses interventions.

Dagneau était encore un lettré. Il avait présidé très honorablement aux destinées de la Société du

Parler Français et à celles de l'Institut Canadien de Québec. Il parlait avec une facilité étonnante tant en anglais qu'en français. Sa voix était chaude, prenante. Pas de grandes phrases ronflantes, pas de métaphores, mais des mots, toujours le mot juste, des anecdotes, des souvenirs, des citations de Mark Twain ou autres émaillaient ses discours débités sur le ton de la conversation la plus intime. On reconnaissait en lui un jugement sûr et pondéré. Ses conseils étaient judicieux, bienveillants et souvent à point. En un mot ou deux il se débarrassait d'un importun et celui-ci n'avait plus envie de recommencer. Il n'était pas toujours agréable à aborder. Sa figure longue, qu'il avait longtemps orné d'une barbe impériale, son nez en cascade, ses grands yeux bleus, tout cela formait un ensemble qui glaçait à première vue et l'importun qui se hasardait quand même recevait, en deux mots, une réponse à ses questions qui ne supportait pas la réplique. Le Dr. Dagneau ajustait son pince-nez, jetait l'œil sur un bout de papier et notre homme avait compris que là finissait l'entrevue. Cependant si on l'intéressait il se mettait à causer, déridant de temps à autre sa grande figure d'un large sourire à l'emportepièce et prouvait à son homme qu'il en savait plus que lui. Cette froideur cachait des trésors de bonté et de tendresse. Que de malades en ont abusé! Ses assistants, les médecins et tout le personnel de l'Hôpital St. Sacrement savent jusqu'à quelle profondeur ils pouvaient puiser.

Dagneau était bilingue et Canadien avant tout. Il était un de ces rares bilingues qui peuvent parler et jouer parfaitement avec toutes les finesses des deux langues anglaise et française. Ses relations avec les médecins de langue anglaise du Canada furent des plus cordiales et dans tous les milieux canadiens on reconnaissait sa valeur. Il fut longtemps, et jusqu'à sa mort, directeur de la Canadian Medical Association. Son grand jugement et son patriotisme ardent, sa science et son bilinguisme rendirent grand service à la Médecine Canadienne. Personne plus que lui n'a concouru à rendre plus cordiale les relations médicales entre les deux grandes races qui se partagent le pays. Il représentait la science et la mentalité française au sein de la Canadian Medical Association. Il contribua largement à la fondation et à l'organisation du Royal College of Surgeons of Canada.

La France avait reconnu sa valeur et l'avait fait Chevalier de la Légion d'Honneur en 1934. Rome l'avait précédemment créé Commandeur de St. Grégoire le Grand.

Pendant de longues années il avait enseigné à Laval la pathologie chirurgicale et l'anatomie. Il gardait avec prédilection la chaire de déontologie, science qu'il personnifiait et qu'il aimait par dessus tout. Il avait habitude de dire, "C'est à l'enseigner qu'on apprend une science". Il savait bien ce qu'il enseignait. Ses cours étaient d'agréables conférences. Ils se terminaient toujours en tangente sur des considérations morales ou scientifiques.

Musicien de nature, son cours sur l'anatomie de l'oreille était une conférence sur des données physiques et musicales. Il connaissait toutes les romances du terroir et la salle d'opération était l'endroit où il les débitait avec prédilestion.

Il était un timide qui se donnait difficilement mais qui se donnait fidèlement.

Il est mort après deux longues années, miné par une maladie cachectisante qui a rongé ses forces petit à petit. Il est mort à l'hôpital St. Sacrement où il avait si ardemment vécu.

Il est parti. Son œuvre, comme celle d'Arthur Rousseau, se perpétuera. Il était un des derniers survivants de cette pléiade d'hommes qui donnèrent à la Faculté de Médecine de Laval la place qu'elle occupe aujourd'hui avec honneur dans le monde médical.

SYLVIO LEBLOND

Dr. William Cole, Long Beach, California, and a former resident of Winnipeg, died on July 9, 1940, at his home. He was born at Melita, Manitoba, graduated from Manitoba Medical College in 1913 and practised at Bredenbury, Sask., before going to France with the 12th Field Ambulance. On his return to Winnipeg Dr. Cole was appointed Neurologist for the Soldiers Civil Re-establishment Board. He lived in California since 1923.

Dr. Roderick Donald Dewar, of Melbourne, Ont., died on May 18, 1940. He was born in 1881 in Glengarry County, where he attended public and high schools, and later graduated from the McGill University Medical School (1908). Later he spent some time in New York City doing post-graduate work. He came to Melbourne in 1909 and had practised there ever since.

Dr. Charles Frederick Dorsey, of Innisfail, died in Calgary, June 30, 1940, of heart failure. He was born in Ontario in 1884, and going through the regular public and high schools, he entered the University of Toronto, from which he graduated with the degree of M.B. in 1908. After doing post-graduate work, he registered and commenced practice in New Ontario, where he remained until 1920 when he came to Alberta and opened an office in Saunders West. He later moved to Red Deer, and was associated with the late Dr. A. De Long. Some years later, he moved to Innisfail where he has practised ever since. The sincere sympathy of the profession goes to his wife and children.

Dr. William Frederick Edwards, of Airdrie, died on June 22, 1940, in the City of Calgary. He was a graduate of McGill University in the class of 1907, and came west the same year. He opened an office in Airdrie, where he continued to practise until his death. He had a great many friends in the district where he was ever on call. His widow, son and daughter have the sympathy of the countryside.

Dr. Alexander Joseph Douglas, medical health officer of Winnipeg for forty years, died in the Winnipeg General Hospital on June 30, 1940, in his 67th year.

It is given to few men to render such long and distinguished service to a community. He became Winnipeg's first full-time medical health officer at the age of 26, but from the first his authority in matters of public health was recognized, and throughout his tenure of office he continued to carry through reforms. When he took up his work in 1900 typhoid fever was rampant, outbreaks of smallpox had been numerous, and there was sore need of pure water and a safe milk supply. During his régime in place of the artesian wells an ample supply of pure water was brought in from Shoal Lake in the Lake of the Woods region some hundred miles distant. Pasteurization of milk was urged and rigid inspection of dairies supplying the city was carried out. The danger of flies as carriers of disease was brought to the notice of citizens, and the effect of these measures was to make typhoid fever a rarity. Free vaccination for children, diphtheria immunization clinics, public milk depots, and the provision of a city health nursing service reduced infant mortality by two-thirds.

Doctor Douglas was born at Erkfrid, Ont., and graduated in Medicine from Manitoba Medical College (1897). After a year as intern in the Winnipeg General Hospital he took post-graduate work in London. He was a Fellow of the American Public Health Association and one of its Vice-Presidents, Fellow of the Royal Sanitary Institution of England, and Past-president of the Canadian Public Health Association. In recognition of his work the University of Manitoba granted him the honorary LL.D. degree in 1937.

Few men have accomplished so much with so little fuss. His office remained at the end of his career as at the beginning in the basement of the City Hall, where his bicycle and old straw hats were stored. Any success of the Health Department he attributed to the activity of his staff. He had a rare gift of friendship and his

stories of old days in Winnipeg have become a legend in the Manitoba Club. A great reader on many subjects, he was an authority on Lincoln and the American Civil War.

Less than a month ago he was present at a meeting of the Medical Faculty Council where he and four other recently retired members were presented with bronze plaques as memorials of their long and honourable service on the Faculty.

Dr. William Arthur Harvie died after a short illness in Regina on May 31, 1940, at the age of fifty-four. He was a prominent Regina surgeon, and widely known in Canadian medical circles.

Born in Orillia, Ont., Dr. Harvie graduated from the University of Toronto in 1908. A year later he began practice in Regina.

Following the outbreak of the Great War he went overseas, and served in England and France with the Saskatchewan No. 8 Stationary Hospital. Since the war he had been surgeon-consultant with the department of pensions in Regina in addition to his private practice.

The following appeared in the *Regina Leader-Post*.

"Dr. Art Harvie went as he would have liked to go —quickly. But with his passing Regina has lost something. He was a man of peace who added nothing to the strife of medical meetings. His work was accomplished without waste of words. When an operation was necessary he did it quietly and efficiently without furore in the operating room. If a patient could pay, that was fine, but if not it was of no importance. When a job was done it was over. He never discussed his patients or his colleagues. Duck-shooting in the fall and his cottage at the lake were his chief pleasures. His family life was ideally happy. He was never too rushed to have fun with his children. Yes, Regina has lost someone kind, gentle and efficient. It was good to know him, and it has been a privilege to work with him.—BY A COLLEAGUE."

Dr. Hugh Burns Hay, of Chipman, N.B., died on June 16, 1940, in his eighty-second year. He had lived in Chipman for fifty-two years, and was a graduate of New York University Medical College, Columbia University (1887). He was born at Woodstock, N.B., the son of Hugh Hay and Melissa Debeck. For years he was Coroner of Queen's County.

Dr. Wilfrid Joseph Heringer, of Port Arthur, Ont., died on June 30, 1940. He was born at Mildmay, Ont., and attended the University of Toronto but moved to Winnipeg before completing his course and graduated in medicine from the University of Manitoba (1913). He was an intern at the Winnipeg General Hospital and shortly after completing his course, enlisted as medical officer with artillery and aviation units. He commanded the Fourth Field Ambulance Corps, with the rank of Lieut.-Colonel. On his return from overseas he practised at Humboldt, Sask., and later specialized in eye, ear, nose and throat diseases before moving to Port Arthur in 1926.

Dr. Charles J. Jamieson, one of the grand old doctors of Winnipeg, died at his residence in Winnipeg on June 27, 1940, at the age of 86.

When he came to Winnipeg in 1882 there were only fifteen doctors to serve a population of 15,000 in the booming western town. He had graduated three years before in medicine from McGill, and practised as physician at a lumber camp near Ottawa before coming to Winnipeg, where for more than forty years he served the community as a general practitioner. Besides medicine, the great interests of his life were curling and politics. He was President of the Thistle Curling Club, President of the Manitoba Curling Association, and an honorary life-member of the Thistle Curling Club, the Manitoba Curling Association, and the Granite Curling Club. He took an active part in curling until he was more than eighty years of age, and for years before that had never missed a bonspiel. For several years he was President of the Winnipeg Liberal Association.

He was born in Ottawa on January 9, 1854, and educated at Ottawa, Woodstock and McGill University (M.D., 1879).

He is survived by his widow, a daughter, and two sons, one of whom is Dr. F. J. Jamieson, of Carman; a son, Capt. F. W. Jamieson, D.S.O., was killed overseas on the last day of the Great War.

Dr. Hugh Arthur Johnson, for about 45 years a practising physician in Port Burwell, Ont., died on June 21, 1940. in his sixty-ninth year.

Dr. Johnson was a son of the late Rev. Hugh Johnson, D.D., of the Wesleyan Methodist Church and was born in Montreal. Following his graduation (medalist, Toronto, 1894) he studied in Baltimore and passed examinations permitting his practising in Michigan and Maryland. After a year or two in the Village of Vienna he moved to Port Burwell.

He was associate coroner for Elgin County for many years, resigning a few months ago. He was also C.P.R. surgeon in Port Burwell for a number of years.

Dr. John James McPherson. The town of Castor, Alta., was saddened on May 11, 1940, when it became known of the passing of one of the town's early citizens, Dr. John James McPherson. Born in Prince Edward Island, where he spent the earlier years of his life and taught school prior to entering Queen's University where he graduated in medicine (1909). Coming to Alberta, he took the provincial examinations and, having passed, registered, and commenced practising in 1910 in Castor, where he remained until his death. He took an interest in the affairs of the district and served on the town council, the public school board, the agricultural society and other organizations.

Dr. Gordon Lemon McFarlane died suddenly about the middle of May, 1940, in Carbon, Alta., at the age of fifty. He graduated from Toronto University in 1911, but did not come to Alberta until 1921, when he registered and opened an office in Carbon, where he remained until his death. He was a man of fine presence, genial personality, and devoted to his patients. The community has suffered a distinct loss.

Dr. Edward Laughton Quirk, of Aylmer, Que., died about the fifteenth day of June, 1940. He was a graduate of McGill University (1888).

News Items

Alberta

The appeal sent to the Alberta doctors to take charge of children of members of the British medical profession, indicates that the profession in Alberta are willing to do their utmost in this regard. It has been suggested that those physicians who are unable to take children on account of age, but who have means, create a fund from which allowances may be made to members of the profession who are younger in the profession and for financial reasons would not be able to assume the necessary responsibility.

The contract tendency is still on the increase, and with the increase there is a tendency to make all contracts less desirable, either in the amount of money paid for services or additional work put on the physician. Two large committees, one in Edmonton, and the other in Calgary, are studying health insurance schemes, such as are in operation in various provinces in Canada, and in the United States.

Injured workmen who are under the Workmen's Compensation Board have not been reporting their accidents immediately to the companies. In order to

educate them, the Compensation Board is refusing physicians' accounts on the basis, that, if the case is not immediately reported, it is automatically thrown out. At the moment, several physicians are very much annoyed at losing the fee for their services through no fault of their own.

G. E. LEARMONTH

British Columbia

The Summer School of the Vancouver Medical Association, held in June, was extremely successful, considering the severe handicaps imposed by war conditions. The most noticeable feature, perhaps, was the large out-of-town attendance, especially of men from the United States. The standard of papers read was well up to the normal. A successful golf tournament was held at the Jericho Golf and Country Club. The weather was at its very best during the whole time. Altogether the Committee in charge of proceedings is well satisfied with the results of its efforts.

The new wing of St. Paul's Hospital in Vancouver was opened on June 30th by Most Reverend Archbishop Duke, surrounded by many notables of the medical and hospital world, as well as by representatives of the Government of British Columbia. This new wing brings the capacity of the hospital to 600 beds, and is to be furnished in the latest and most up-to-date style. It contains a new infants' department, of 60 beds, furnished and arranged according to the most modern ideas; an entirely new physiotherapy department with all the latest equipment, and many other features.

This completes the plan to which the Sisters of Providence of Montreal, the Mother-House of the Order, have been working for many years. It marks the culmination and the successful completion of at least thirty-five years of effort. Beginning with a modest wooden frame building, St. Paul's has been a landmark in the hospital world of British Columbia ever since. Its unfailing policy of complete service, always up-to-date in every particular, has made it from the beginning the reliable and trusted friend of every medical man in Vancouver, from the lowliest general practitioner to the most advanced of specialists. As the years go by, it has added to its equipment with advancing knowledge and in accordance with the demands of the profession, till today it need not fear comparison with any hospital on the continent. As regards the public, its hold on their affection and confidence has never weakened; the kindly, gentle, personal care given to every one of its inmates has established St. Paul's in a unique position in the community.

The new building of the Kelowna General Hospital, which was officially opened on May 26th, was erected and furnished at a cost of $140,000. It is of reinforced concrete and tile construction. The ground floor houses the administration offices, x-ray, kitchens and dining rooms. The second floor provides an up-to-date obstetrical suite and wards. The third floor is given over to wards and a complete surgical suite. The former maternity wing in the older building which was recently constructed is being used for medical and pædiatric cases.

The following are members of the medical staff: Dr. L. A. C. Panton, President; Dr. W. F. Anderson, Secretary; Drs. B. de F. Boyce, W. J. Knox, A. S. Underhill, J. S. Henderson and J. M. Hershey, Medical Officer of the Okanagan Health Unit.

The Kelowna Hospital Society, and the City of Kelowna, aided by the Provincial Government, are responsible for the provision of this excellent institution.

The Western Branch of the American Urological Association held its meeting in Victoria at the Empress Hotel on July 29th to 31st inclusive, these meetings being open to all medical men in British Columbia.

J. H. MACDERMOT

Manitoba

A fully-equipped modern hospital to serve approximately 1,600 Indians was officially opened July 6th at Fisher Branch, Man. The dedication address was given by John McEachern, past president of the Canadian Tuberculosis Association and chairman of the Sanatorium Board of Manitoba.

The 20-bed hospital will replace a nursing station in Fisher Branch. Until now, Indians in the district had to be taken to Winnipeg for hospital treatment. The hospital will be staffed by a resident doctor, Dr. W. N. Turpel, three nurses and Indian help. The building is equipped with electric light.

Dr. P. E. Moore, acting superintendent of medical services, department of Indian affairs, presided at a dinner held in the hospital as part of the opening ceremony.

Chief Albert James Murdock, chief of the Fisher River Indians, spoke in Cree, expressing the gratitude of the Indians for the hospital. Dr. F. G. Stevens of the United Church mission, interpreted.

Others who spoke included Rev. Henry Metcalfe, of the Anglican church mission; Dr. J. D. Adamson and Col. J. Y. Reid, of Winnipeg; N. B. Bachynski, M.L.A.; Dr. Murray Campbell, superintendent of Dynevor Indian Hospital; Dr. Turpel, medical superintendent of Fisher River Hospital, and Dr. R. C. Corrigan, medical superintendent of Norway House Indian Hospital.

Major G. H. Ryan, of Winnipeg, surgical specialist with No. 5 general hospital has been placed in charge of the foot clinic set up for the Canadian troops in England.

Two distinguished Icelandic scholars from Winnipeg have filled a rush order for a word manual for use of Canadian soldiers stationed in Iceland. They are Dr. S. J. Johannesson and Einar P. Jonsson, editor of one of Winnipeg's oldest Icelandic newspapers. Both have reputations as poets and scholars in Icelandic circles. The manual was completed within a week owing to the fact that Dr. Johannesson and Mr. Jonsson worked day and night to complete it. The Icelandic manual is uniform with the French manual issued to troops that went to England.

Recruiting began on July 2nd for the Third Field Ambulance, R.C.A.M.C. of the Canadian Active Service Force and is going on vigorously. The Commanding Officer is Major W. M. Musgrove who served in the last war with the 11th Field Ambulance. Capt. F. Hartley Smith is second in command, and the Acting Adjutant is Lieut. Glenn F. Hamilton. Other officers are G. C. Fairfield, F. R. Tucker, and W. B. Mackinnon.

Dr. John A. Gunn, C.B., O.B.E., F.A.C.S., has been appointed Chief Medical Officer of the Manitoba District of the C.P.R. succeeding Dr. A. W. Moody who retires. Dr. Gunn had a distinguished career in the war of 1914-18 when he was Officer Commanding at the No. 1 Canadian General Hospital at Etaples. Later he became Professor of Surgery in the University of Manitoba, and on his retirement in 1939 he was made Emeritus Professor of Surgery.

At the recent annual meetings of the Canadian Tuberculosis Association in Montreal it was announced that the annual Research award, valued at $250 and presented by the Association for an essay on Tuberculosis investigation had been won this year by Dr. A. L. Paine, of the Manitoba Sanatorium, Ninette.

ROSS MITCHELL

New Brunswick

Among others in New Brunswick who responded to the appeal for donations to the Red Cross, the Hon. Dr. Murray MacLaren has offered to provide an ambulance. This offer has been accepted.

At this time of national emergency, when so many physicians are doing their bit in aid of their country, it is perhaps of interest to note that Dr. L. R. Murray, of Sussex, who joined the Canadian Militia in 1886 and first attended Militia camp as a medical officer in 1896, is still serving as M.O. to the Princess Louise Hussars at Sussex camp this summer. Dr. Murray saw active service in the last Great War. His qualities of cheerfulness and willing service make him an invaluable officer to his unit.

Dr. W. J. Murphy, of West Saint John, who has been serving as a Lieutenant in the R.C.A.M.C. has just been gazetted as Captain.

Among those recently joining the C.A.S.F. from the medical profession in New Brunswick are Lieut.-Colonel A. B. Walter, of Saint John, Dr. Robert Gregory, of Fairville, and Dr. H. E. Baird, of Chipman.

Dr. F. F. Ramey, of Fredericton, has recently been gazetted a Captain in the R.C.A.M.C.

A. S. KIRKLAND

Nova Scotia

The Hospital Association of Nova Scotia and Prince Edward Island held its annual meeting at Bridgewater. Group hospitalization was discussed extensively. Resolutions were passed, (1) that regional groups of hospital workers develop good-relations programs to win the interest and goodwill of the public towards their hospitals; (2) that the Association pledge full co-operation with the Department of Health in all problems arising from the present world crisis.

Dr. Harvey Agnew addressed the convention on "Hospital administration of today". Rev. Mother Ignatius was elected president for the ensuing year.

The Cape Breton Hospital, Sydney River, has officially opened its new 142 room annex.

Dr. C. E. A. DeWitt, Wolfville, has moved to Halifax to take over the post of Deputy District Medical Officer to Military District No. 6.

Dr. Harold Taylor (Dal., '36) has been appointed assistant to Dr. Ralph Smith, provincial pathologist and Dalhousie professor of pathology. Dr. Taylor, who has been studying in Scotland since graduation, succeeds Dr. Molly MacHugh who returns to her native England.

Dr. Arnold Noble, F.R.C.S.(E.), Halifax, has been elected to fellowship in the Royal College of Surgeons, Canada.

Dr. C. D. Dobson has opened an office in Yarmouth.

Dr. Hazen C. Mitchell has taken over the practice of Captain B. F. Miller, New Waterford.

ARTHUR L. MURPHY

Ontario

Dr. John A. McCollum, of Toronto, has been surgeon in charge of the Canadian National Exhibition Emergency Hospital at Exhibition Park for many years, as well as a judge at the annual baby contest. He has been associated with the Exhibition for over forty years. As a mark of appreciation, the Directors have presented him with a beautiful Sheffield tray bearing an appropriate inscription. He will be succeeded by his assistant, Dr. Clifford Watson, F.R.C.S.

On June 24th Dr. Geo. D. Porter, now Director of the Student Health of the University of Toronto, was presented with a silver plate on the occasion of the fortieth annual meeting of the Canadian Tuberculosis Association of which he had been "Secretary for thirteen years, a Vice-President, and valued member of the Executive Council for thirty-two years, as an appreciation of his contribution to the tuberculosis campaign in Canada".

Dr. William Charles White, a graduate of the University of Toronto (1898), was awarded the Trudeau Medal of the National Tuberculosis Association at the annual meeting in Cleveland in June, in recognition of his research work in tuberculosis. Dr. White is Chairman of the Division of Educational Relations of the National Research Council and Consulting Pathologist to the United States Public Health Service.

Dr. Basil C. H. Harvey, B.A. '94, M.B. '98, University of Toronto, Professor of Anatomy and Dean of Students of the Division of Biological Sciences of the University of Chicago, will become Professor-emeritus next September.

Formerly in general practice and associate pathologist at Hamilton General Hospital, Dr. J. W. McCutcheon has been appointed Assistant Secretary of the Ontario Medical Association.

The 1939 Report of the Toronto Public Library Board, recently issued, contains as a Foreword an address by Dr. H. Glendinning, Chairman of the Board.

It is announced that all members of the Medical Faculty of the University of Western Ontario have been asked to sign a pledge of allegiance to Canada and the allied war effort.

At the annual meeting of the Federation of Medical Women of Canada, held at the time of the Canadian Medical Association meeting, Dr. Anna Leslie of Winnipeg was elected President and Dr. Ruth Brown, of Saint John, N.B., Vice-President.

At the Graduation Exercises in connection with the Belleville General Hospital, Dr. Malcolm MacEachern announced that the Hospital is now listed as an approved hospital by the American College of Surgeons. It is announced that similar honour will be paid the two Chatham hospitals in October.

Dr. J. A. Dobbie, of Ottawa, presided at the annual meeting of the Grand Lodge, A.F. & A.M. of Canada in the Province of Ontario in Toronto last month.

At the seventy-fifth annual meeting of the College of Physicians and Surgeons of Ontario, there were 12 applications from doctors who fled to Canada from Sudetenland, Austria, and other parts of Central Europe. Seven of these were admitted to Canada by Federal Order-in-Council, and five entered in the ordinary way. Ontario regulations demand that each applicant be interviewed separately by the Education and Registration Committees with British citizenship as a condition before a certificate to practise will be granted. Each must pass the examination of the Medical Council of Canada. During the five years' residence necessary for qualification for British citizenship, some of these alien doctors will be offered internships in various hospitals.

The College also decided to establish reciprocity with the British Medical Council, whereby doctors registered with the Ontario body will be permitted to practise in England and doctors registered in England would have the same privilege here. Dr. E. G. Davis, of London, was elected President with Dr. M. H. V. Cameron, of Toronto, Vice-president.

J. H. ELLIOTT